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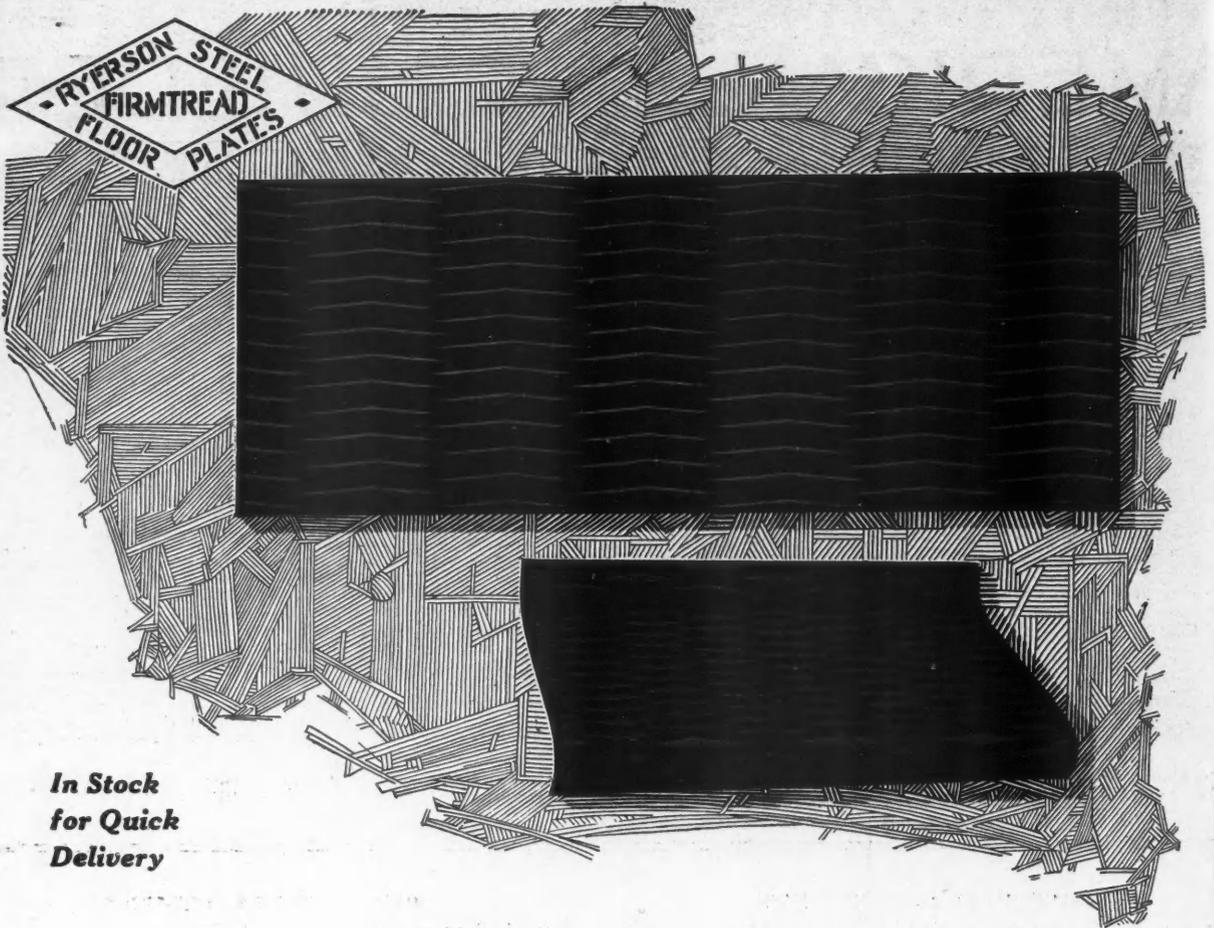
Vol. 29

August, 1920

No. 5

Table of Contents

	Page		Page		Page
Short Talks by the Editor	65	Disguise Building for Civic Beauty's Sake	95	New Wall Plug Prevents Damage	128
Persistency in Business	65	An Efficient Two-Car Garage	96	This Refrigerator Supplies Own Ice	128
Loans for Essential Building	65	Blueprint—Garage Heating	97	New Garage-Door Holder	128
Do Not Forget Times to Come	65	American Home Builders in the Orient	98	Steel Lumber Admitted as Fireproof Construction	128
Fighting the Housing Shortage	66	Design of Safe Construction	100	General Contractors Select Manager	128
Cartoon	67	Effect of Loads and Moisture on Strength of Timber	100	Out on the Job	130
Our Front Cover Modern Home Design	68	Law for the Builder	102	Excavating Under Unusual Conditions	130
Artistic Stucco Entrance	71	Erecting Lightning-Proof Buildings	103	Time-Saving Drafting Machine	132
Woman and the Home	72	Employers Finance Home Building Project	104	Sash in Window Disappear	132
Housewife Commanding Figure in Home	72	Fred Beard Says: "Kitchens Should Be Planned to Accommodate Modern Labor-Saving Equipment"	106	Motor Trucks and Trailers	134
How to Lay Linoleum Flooring	75	Correspondence Department	108	Delivering the Goods	134
Blueprint—Linoleum Flooring	76	Framing Name in Shingle Roof	108	Builders' Supply Company Operates Fleet of Eight Trucks	136
Charming Dutch Colonial Home	77	Problem in Brick Laying	108	Helpful Hints for Warm Weather	142
Cozy Bungalow of Comfortable Size	78	Mortar for Glazed Brick	108	Jack-Knife Trailer in Lumber Yard	142
Industrial Building Holds Lead	79	Attractive Group of Farm Buildings	108	News of the Field	146
Running Water in the Farm House	79	Can You Help Him Out?	110	Gorham Company Opens Chicago Office	146
Substantial and Modern Farm Home	80	Points Out Errors in Problems	110	Southern Pine Association Issues Revised Manual	146
Blueprint—Water Supply Systems	81	American Builder Helps in Barn Building	110	New Universal Products Sales Manager	146
Steel Lumber Intact After 60 Years	82	Builds Beautiful Inlaid Table	112	American Cement Plaster Company Joins Beaver Board	146
Sheet Metal—Tin Roofing	83	Has Time Sheets to Figure Costs	112	Winther Starts New Building	148
Imposing Bank Building of Modern Design	84	Making Newel Caps on Machine	112	National Pressed Steel Opens Baltimore Office	148
Blueprint—Sheet Metal (Tin) Roofing	85	Concrete Construction	114	Goodyear Opens Plant in Los Angeles	148
Attractive Story-and-a-Half House	86	Corner Construction of Concrete Block	114	Meadows Company Dedicate New Plant at Bloomington	150
Economy in Lengths, Sizes and Quality of Lumber	87	Making the Factory Attractive and Safe	120	Bestwall Consolidates with Beaver Board	150
Steel Lumber Construction	87	What's New?	124	Catalogs, Bulletins and Books Received	152
Blueprint—Steel Lumber	88	Draft-Proof Ventilator for Homes and Offices	124	Sunlight Factories Increase Production	154
Substantial Brick House with Ornamental Roof	89	Hog House Window Has Ventilator	128		
The "Simplicity House"	90	Machine for Bending Reinforcing Bars	128		
How a Builder Won Success	91				
"Putting the Flgs in a Farlor"	92				
Blueprint—Hog House Roof Windows	93				
Modern Two-Apartment Building	94				
Heating Systems in Garages	95				



**In Stock
for Quick
Delivery**

Great Strength and Safety in "Firmtread"

"Firmtread" Steel Floor Plates and Treads present the best, strongest and cheapest all-around safe surface on the market.

Strength.—"Firmtread" is rolled from open hearth steel, having a tensile strength of 55,000 to 65,000 lbs. per square inch, elongation of 20 per cent to 25 per cent and elastic limit of about 35,000 lbs.

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*We shall be pleased to send you complete
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Short Talks by the Editor



Persistency in Business

NOWHERE is persistency and perseverance more essential than in the building business. Continual drive, push, and hustle will get results in the face of seemingly insurmountable obstacles. Spasmodic efforts that pass like the mist before a sun arouse a temporary interest that is dissipated almost as soon as conceived.

Repetition makes reputation. For that reason the builder, the building material dealer, the manufacturer of building equipment and machinery, must hammer away unceasingly to build up the reputation that brings returns. They must all boost their business either thru personal aggressiveness or by means of the printed advertisement. And in the latter is centered the instrument that, handled skillfully, possesses resource and power that thrives on its own impetus.

Spasmodic advertising does not pay. The interest once gained thru publication should not be lost. On the contrary, it should be emphasized until it becomes enthusiasm. To be of the utmost benefit it must be persistent—continuous. Its results are cumulative. Each advertiser should strive to be distinctive. Just as he shall sow so shall he reap.

The opportunities for putting your business on a basis that will stand all shocks in the days to come were never, so plentiful, never so promising as they are today in the building field. The world awaits the unleashing of the forces which have been held back for years by unforeseen circumstances. While the pessimist may prate and bemoan, the fact remains clear and as illuminating as the light of the sun, that the glorious time is not far off.



Loans for Essential Buildings

CONCERTED action has been started in New York to deflect some of the loans to homebuilding. In view of the attractive rates offered by theater promoters for loans on new buildings in that city, prospective homebuilders and housing sponsors find it extremely difficult to obtain money for homebuilding purposes. The rate on this type of loan has remained about the same and as a result little money is being let out.

To counteract this tendency, the newspapers are contemplating a campaign against building anything but homes and want legislation enacted to halt excessive

theater and garage building until the home shortage is relieved. Thousands of complaints are being received daily by the city officials. It seems very likely that some sort of law will be passed restricting non-essential building until the money market adjusts itself.

Some large concerns which loan enormous sums of money yearly have already indicated their intention to finance home building at normal rates. One insurance company has set aside a fund for that purpose. It is only thru co-operation of this kind that any relief can be obtained. Money is needed for homebuilding; homes are the cornerstone of the nation. Non-essential industries should be willing to wait their turn.



Don't Forget Times To Come

THE demand for merchandise right now is the greatest this country ever knew," says a writer in *Printer's Ink*. The producers have not yet succeeded in lining themselves up to take care of it. This being so, some of them are stopping their advertising. Advertising, they reason, is for the purpose of getting business. If they have more business than they can take care of, why advertise?

"This is something like the problem that confronted manufacturers during the war. Then some of them had nothing to sell to their trade in general. Their entire output was ordered in advance for war purposes. There was little incentive to advertise so far as immediate business was concerned. There was a sharp difference in the policy carried out by different manufacturers under these circumstances. Some went right ahead with their publicity regardless of their inability to sell goods. They did this that their products might be kept advertisingly alive. Others stopped their advertising.

"When the ending of the war released their products the first group found it a simple matter to catch up once more the broken threads of their trade. They needed no special advertising campaign. They just went ahead naturally and logically. Today they are cashing in on the cumulative benefits of the advertising they have done in years past—a benefit that would have deteriorated had they not kept their good will alive by advertising during the war when they had little or nothing to expect in the way or direct returns."

Fighting the Housing Shortage

EMPLOYERS AND PUBLIC SPIRITED CITIZENS ARE CO-OPERATING IN BIG PROJECTS TO ERECT HOMES FOR WORKMEN AND FAMILIES

THERE is one way to solve a problem—that is to attack it. That is just what the house shortage problem is up against today. It is being subjected to the hardest attacks in its career. A regular bombardment from all sides is slowly driving it to cover.

Each day brings one or more announcements of new housing plans that have been started and are proving great successes. In Chicago, a housing organization, composed of public spirited citizens and large employers of labor who subscribed to a fund to build homes, has finished the first lot and is now starting on 2,000 more. It was a great achievement.

Perhaps no one appreciates the home shortage more keenly than the man who has to employ hundreds and thousands of workmen. His big problem today is labor turnover, the incessant quitting and hiring of men. He knows that there is one solution for this enormous overhead—a home for every workman. The man who owns his own home is not liable to drift around the country. He has something definite, something very dear, to keep him on the job. He is an integral part of the community.

For that reason employers are working hard to alleviate the housing shortage in their localities. Elsewhere in this number you will find a story of a small group of manufacturers who seized the "bull by the

horns" and built homes. The results were amazing. The discontent of the help decreased perceptibly. Their production increased.

It is a hopeful sign. Recognizing the condition as a real live problem and not something to be talked about and nothing more, these organizations are doing a work that will be a benefit of the community and nation.

This is not the time to slack. Every builder, contractor, and architect should be on his toes, pushing his business before the community in which he lives, awakening the support of the big men in his town. Pessimists are like weeds, quick to seed and grow over night. The best cure is prevention. Homeless people are bound to become pessimistic, a very dangerous state of mind. The antidote is available—all it needs is application.

The senate has appointed a housing committee which will make an extensive investigation of the situation. What they are anxious to receive are comments and suggestions from builders thruout the country. With all these forces combined in one vast effort to combat this most important problem, an early and satisfactory solution is in sight.

By hammering home continually to their clients the value of home ownership, builders and contractors can accomplish much.

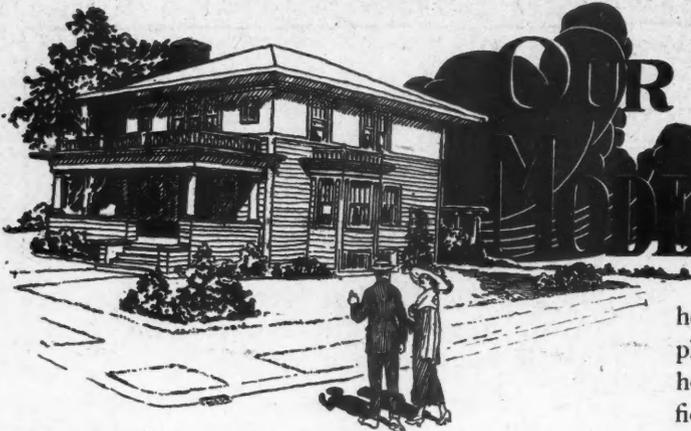


A Beautiful Street of Homes Is the Best Reflection of a City's Prosperity and Stability. Contented Homeowners Take Pride in Their Citizenship and Are Immune to Professional Agitators of Discontent.



"She rules her domestic kingdom with woman's unerring intuition and gracious dignity. More homage to the queen of the home! The best is none to good for her."

Builders and Architects Know Whom They Must Please with the New Home. We Are Adding a New Editorial Department with This Issue of Special Interest to the Women.—EDITOR.



OUR FRONT COVER MODERN HOME DESIGN

"I 'VE spent my whole life longing for a real home with plenty of room and every convenience, a home where 'wifey' can do her work with ease and get real enjoyment out of doing it, a place where the 'kiddies' can romp and grow up healthy and cheerful—and now I've got it."

It is an ambition worthy of the noblest, a real mark to shoot at, and with its consummation comes that feeling of satisfaction and pride that no one can steal. What better incentive could be offered for saving, co-operation, and real hard work than a home like the one shown on the front cover this month! It is everything expressed in the sentiments above.

This building represents a home of the substantial comfortable type that should appeal to families, especially those with children. Nowadays, the children element is too often neglected in the planning and building of homes. In the one, two, and three-room apartments with space-saving beds and kitchenettes they are distinctly out of place. There is little room for them and even if there was, the landlord inserts a clause in the lease prohibiting children.

For that reason a roomy

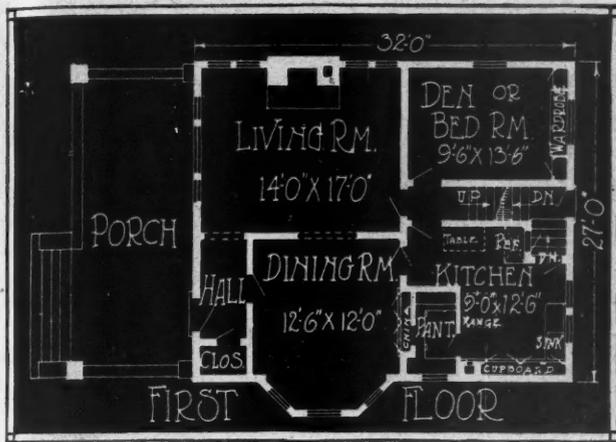


More Attention Paid to Cradles and Nurseries Like the One Shown Here and Less to Hectic Amusements and Reckless Extravagance Would Help a Whole Lot Toward Solving the Present Home Building Shortage. This Happy Family Is Reaping the Reward of Thrift Applied in the Right Direction.

home like the one shown on the front cover is a pleasant picture for the man of family who loves a home for its intrinsic qualities and not mere superficial trimmings. Here he can have comfort, convenience, and children without fear of man or law. A large playground at all sides provides the healthy atmosphere that youngsters need and the comfortable arrangement of the interior and large roomy porch give them ample opportunity to get rid of the efferescence of youth. This is a family home, one that should arouse the envy of all real people.

Designed along the familiar square line with hip roof, it has been constructed of frame and stucco, with a solid 12-inch concrete foundation. The drop siding up to the level of the second story windows forms a pleasing contrast to the stucco exterior which extends above to the roof. The hip roof is not unusual by any means, but as popular as ever and lends a feeling of strength and character to the house which is bound to make a favorable impression.

A short flight of steps leads to the wide porch extending the full width of the house. Its roof is



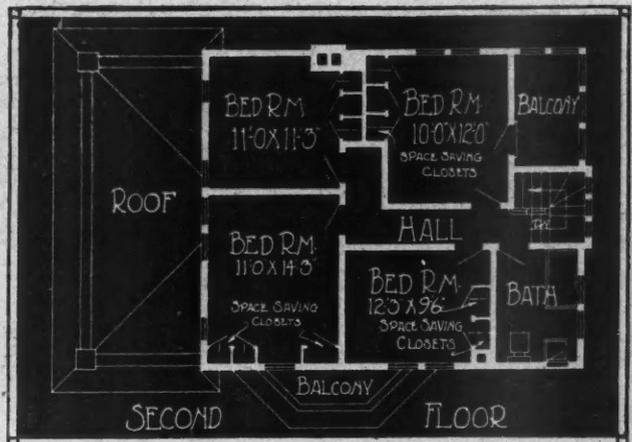
First Floor Plan of Front Cover Home Showing Attractive Arrangement of Rooms. Note the Modern Equipment in the Kitchen. The Living Room is Large and Cheerful.

supported by stout, well-designed pillars of white. By the addition of an attractive railing a balcony has been provided for the upper floor.

The lower porch leads into a reception hall, which in turn opens into the dining room and living room. A small closet has been built in one end of the hall for street clothes. The living room which faces the porch is 14 by 17 feet, well lighted by a triple window and two pairs of small double windows on the side. They are on each side of a large open brick fireplace. Opening off the living room to the rear is a den or bedroom as the owner may wish. It has two large windows and wardrobes on either side of the rear window to serve as closets in case the room is used as a bedroom. A window seat has been built under the large window in the rear of this room.

Connected with the living room by an open doorway and located immediately in back of the hall is the dining room, a modern, comfortable room, 12 feet 6 inches by 12 feet, with a large bay window. It is connected with the kitchen to the rear by a swinging door, but the builder has provided another means of access thru the pantry which will save many steps and much work for the housewife. Between the dining room and pantry is a large china closet opening into both dining room and pantry. Dishes and food can be passed thru this closet without going around thru the door from the kitchen to the dining room.

In the kitchen, 9 by 12 feet 6 inches, a range, refrigerator, kitchen cupboard for utensils, food, etc., sink and work table are provided. The icebox opens thru the wall to the outside entrance, where the iceman can deliver his



Second Floor Plan. Four Bedrooms and Bath Have Been Provided for on This Floor. Space-Saving Closets Have Eliminated Much of the Waste in Floor Space.

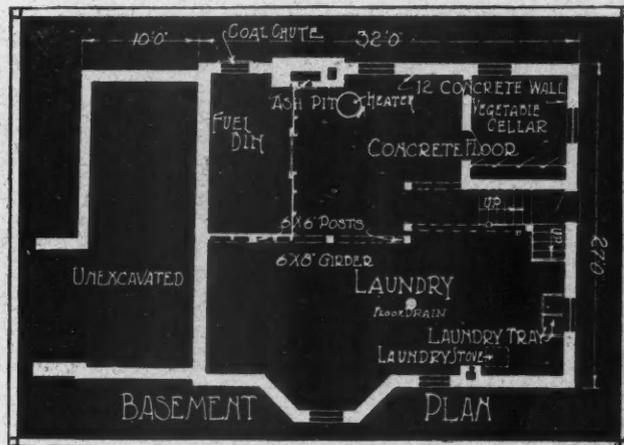
ice without disturbing the housewife or tracking up the kitchen floor after it has been cleaned. The stairway to the basement starts in the kitchen.

As mentioned above, the large balcony over the front porch is one of the comfort features on the second floor. It can be reached from either of the two front bedrooms and makes a delightful playroom for the children. Four bedrooms and a bathroom make up this floor plan. An additional balcony over the rear porch is also provided. These bedrooms are well lighted and plenty large enough. Space-saving closets have been built in all of these rooms. Under an ordinary arrangement with closets, four bedrooms of this size would not be possible in a building of these dimensions. As originally planned, this home contained provision for only three bedrooms, but the builder found that by using space-saving closets he could fit in another bedroom.

The bathroom is modern in every respect, being fitted with built-in fixtures and finished with attractive tile flooring and walls.

In keeping with the general plan of the builder to make this a real home, the basement has been designed in a particularly efficient manner. Many labor and space-saving arrangements have been embodied in the floor plan.

To begin with, a substantial and sanitary floor of concrete has been laid. The floor of the basement is far more important than many are wont to consider. Unless built well and drained properly, it will be a continual source of dampness which is bound to affect the floors above. In this basement a drain has been built in the section designed to be the laundry to take care



This Basement Plan Shows How a Modern Basement Should Be Laid Out to Get Efficient Results. The Large Laundry, Vegetable Cellar and Fuel Bin Are Essential Features.

of the large amount of overflow water which accumulates there.

The laundry is equipped with a laundry stove and suitable trays, and is large enough to afford plenty of drying room in case of inclement weather. In a home like this the modern washing machine and mangle are essential parts of the household equipment. Ample provision in the way of electric receptacles and outlets should be provided in the original plans.

The heating plant is situated on the other side of the basement adjacent to the fuel bin. An iron coal chute built thru the wall eliminates the dirt and labor attached to the old way of getting in the winter supply of coal. Very close by is the large ash pit in the base of the chimney, a very practical device for collecting ashes where they can be removed with a minimum of trouble and dirt.

The vegetable cellar completes the plan—not only very convenient for storing vegetables during the winter, but an excellent cooler for perishable foodstuffs in the warm days.

With these facts in mind, it is not difficult to picture what an ideal and delightful home this front cover house will make. It represents the best of architectural and building skill, a careful study and applica-

tion of the latest principles in building conveniences with always a sympathy, carefully attuned to the wishes of the housewife, and an appreciation of the needs of the children who, despite popular tendencies, are still an essential feature of modern civilization. The builder of this home reflects thru his workmanship the type of men who are intrusted with the great work of housing the many thousands literally starving for a shelter, and who are fulfilling the exacting demands made upon them.

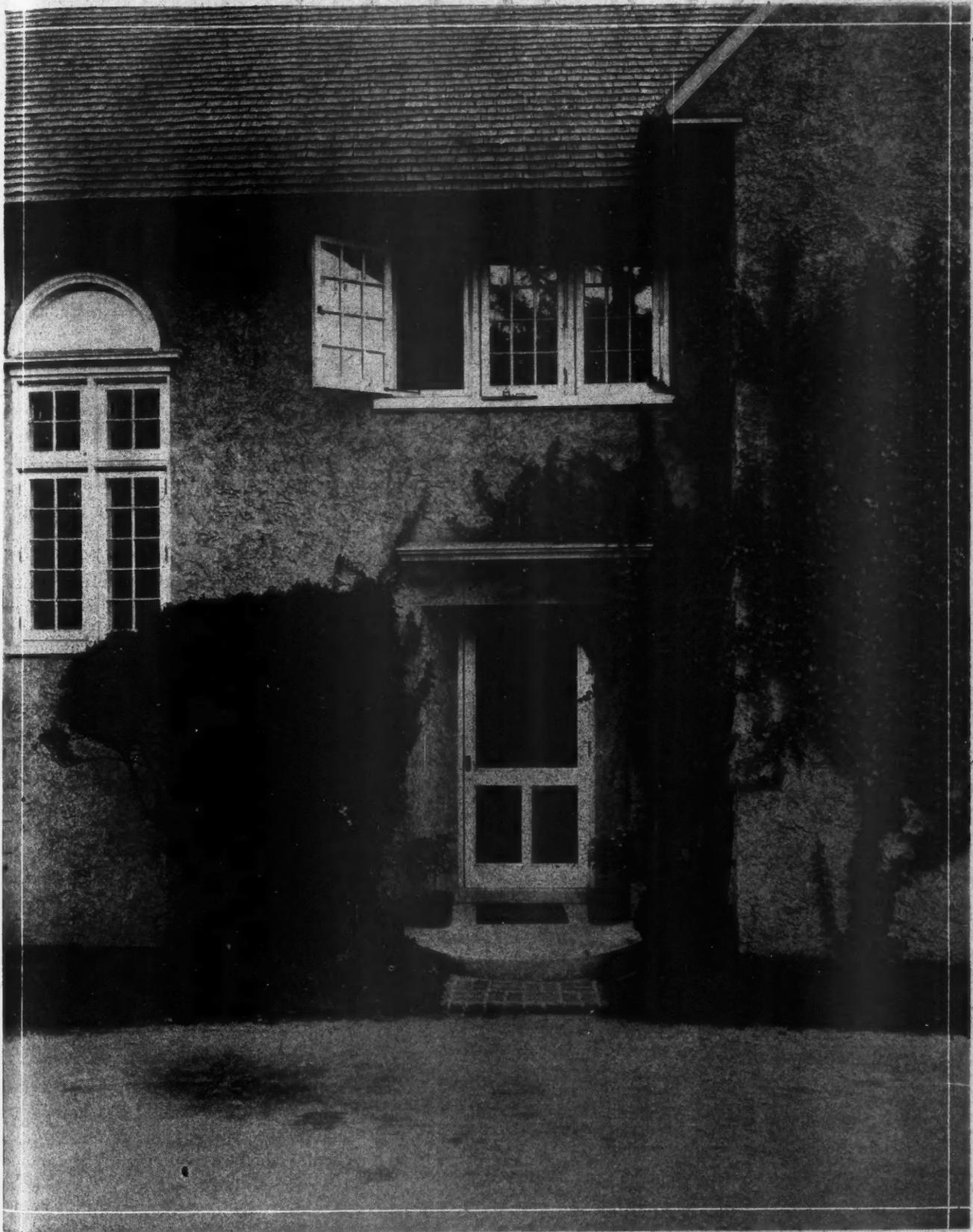


The Wooden House in England and France

“THE boom in wooden houses continues,” says the United States Consul at London, in a “Review of the British Timber Market” as reported by the Bureau of Foreign and Domestic Commerce. “Firms whose plans have received the approval of the Ministry of Health are full up with orders. Wooden houses of Douglas fir are to be imported from British Columbia, ready for erection. A firm of Norwegian exporters is also planning to send Norwegian wooden houses to Great Britain, which can, it is claimed, be erected in about eight days.”



Interior Finish Is One of the Most Important Parts of a Real Home. A Harmonious Combination Such as Is Presented in This Bedroom Adds Infinitely to the Appearance of the Home. Attractive Homes Are Bound to Reflect Credit on the Builder and Bring New Clients. Homes Are no Longer Merely Outside Walls, Floor and Roof. Many Other Factors Enter the Contract.



ARTISTIC STUCCO RENDERING. In the hands of a skillful builder stucco is a "wonder" material that can be worked with very charming results, one of which is shown in this attractive corner of a beautiful home. In this home exterior the rough finish has been used. It forms a most harmonious background for the unusually designed small pane windows with white sills and sash and the attractive side entrance. There is something appealing and inviting about this scene enhanced as it is by the clinging vines. The small circular stone doorstep with its brick supplement is another feature that tends to make this whole picture different.



WOMAN AND THE HOME



Housewife Commanding Figure in Home

INTRODUCTION OF SPACE AND LABOR-SAVING DEVICES HAS GIVEN HER OPPORTUNITY TO EXERT TREMENDOUS INFLUENCE

BACK in the stone age, the male of the species used to pick out the mate who appealed to his fancy, kidnap her, if she did not agree to his opinion, and drag her off by the hair to his lair. She became his vassal wife; he her lord and master. He hunted game while she performed the duties of a household beast of burden. Even today we read of modern cave-men who have not yet felt the hand of progress.

But as the ages changed from stone to bronze, and then to iron and steel, the status of woman changed, too. She gradually assumed a more prominent and less irksome position in the household arrangement

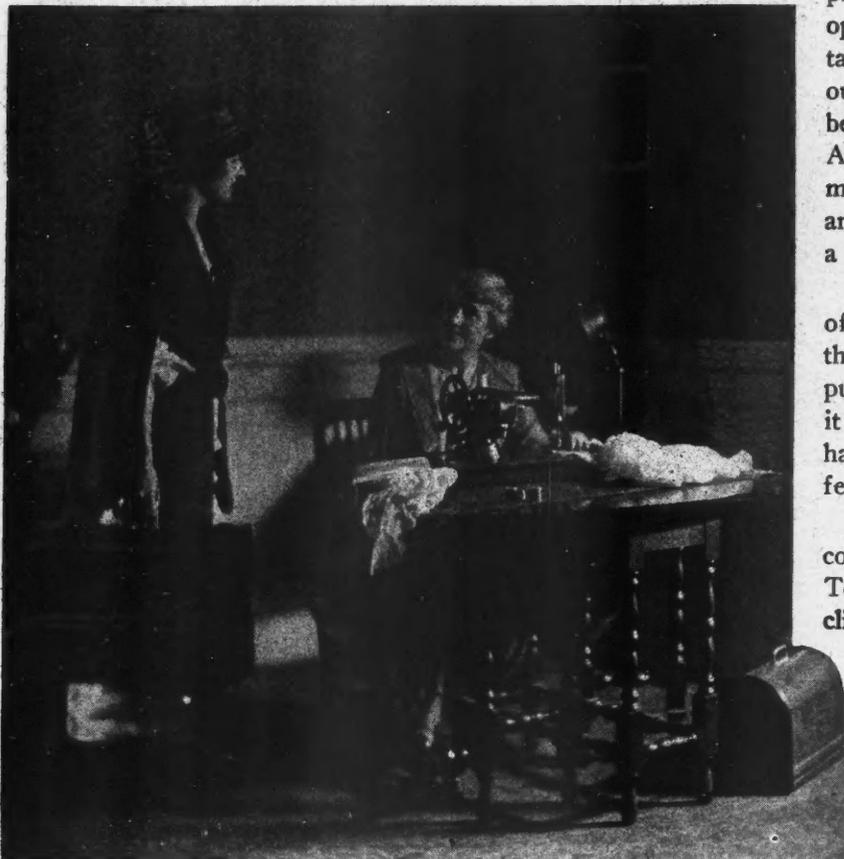
until today she is the guiding spirit in its management. As man has been called upon to devote more of his time and energy to business, the wife has gained a power, while different in its quality, is just as far-reaching and important in her own sphere. She is the dominating figure in the home, her realm of interest.

"A woman's sphere is the home." Very truly, provided that home is a real one and not a place of drudgery.

Nowhere is the modern emancipation of woman more clearly shown than in the home. From a place of ceaseless and heart-breaking toil and drudgery, it has become, thru modern inventions, a workshop of pleasure where the housewife has every opportunity to perform the essential tasks and have plenty of spare time for outside activities. The transition has been one of amazing speed and extent. And in this development, electricity, modern building, space-saving devices, and labor-saving appliances have played a big part.

The kitchen is no longer the galley ship of the housewife, where she slaves into the late hours of the night. While in purpose the same as ever, in appearance it has been transformed so that it is hardly recognizable, as the kitchen of a few years back.

Not so long ago the woman was not considered in the plans for a new home. Today the builder in consulting with clients who are planning a new home, does quite a bit of his talking to the wife. She has certain fundamental ideas about the arrangement of rooms, equipment, etc., because she has to work there. She knows how many steps can be wasted, how energy can be dissipated, how spirit can be broken because of an inefficient kitchen, an inconvenient laun-



The Changing World. Sewing Circles Have Been Caught in the Merry Whirl of Progress and Are no Longer the Mecca of Busy Threads and Needles. Electric Sewing Machines Are the Order of the Day and Each Member Brings Her Own.



Drudgery Flew Out the Window of This Sunshine Kitchen When the Electric Iron and Range Came in the Door. This Housewife Enjoys Working in a Happy and Cheerful Room Like This Because She Can Accomplish Many Things in a Short Time.

can weave about the family is the cornerstone of a successful home and family. And for that very reason too much cannot be done in the way of making her task as easy and pleasant as possible.

Inventive genius has made great strides in this direction. Building skill has reduced large, awkward, work-producing rooms to happy little nooks by providing kitchen cabinets, electric ranges, kitchenettes, breakfast rooms, and space-saving beds. In the modern bathrooms with their immaculate and easily cleaned tile floors and walls, and fixtures, the small step-saving kitchen with linoleum or other attractive and efficient floors, the builder has demonstrated his skill and versatility.

With the aid of electrical labor-

dry, an insanitary bedroom. She has in mind some dainty touch that will make the living room cheerful, tasty, and homey, and that little idea has a profound effect on the decision they will make as to interior finish.

Take, for instance, the color scheme of the walls. She has it thought out while the man is busy figuring brick, foundations and roof. The particular kind and hue of window shades, draperies and that sort of thing are very clear in her mind's eye. Naturally they determine to a large extent the final arrangement of many constructive details.

For, after all, what is home without a mother, sister, or daughter? The feminine touch, that indefinable environment which only a woman



When the Woman Finally Assumed Active Charge of the Household Machinery She Demanded and Got Results, Especially in the Way of Labor-Saving Devices, That Have Helped to Drive Drudgery and Heart-Breaking Toil Out of the Home. Scrubbing Was One of the Chief Offenders. Here Is One Antidote.

saving devices he has been able to build a home that is a delight to the housewife.

The old wash room—we cannot dignify it with the name laundry—was a place to be shunned, for it meant a day or more of heart-breaking work. The hand washing machine marked the first step in the breaking away from the slave era and now with electric machines and mangles the misery of the past has become a very misty and unregretted memory. Again the influence of woman has worked the magic spell.

When one stops to consider the innovations in household management, inventions in space-saving devices and labor-saving appliances, he is amazed at the wonderful results that have been accomplished—and all due to the changing status of woman with regard to the home. An analysis of the reasons for the activity of woman in politics, civic affairs, and national problems reveals the outstanding fact that the change in home conditions has been responsible.

She has been relieved of a mass of unnecessary drudgery that formerly occupied her entire time and energy. Today the home is infinitely more attractive, more comfortable, yet she can take care of it in much shorter time.

The whirl of an electric motor tells the tale of the vacuum cleaner, the sewing machine, the bread mixer,

and a multitude of other essential household machinery. Agonizing hours spent over a hot cook stove on ironing day have been replaced by pleasant moments in a small, cool kitchen with an electric iron. Dirt and soot is now a strange sight where ranges hold forth.

She is vitally interested in the kind and operation of the heating plant upon which so much of the comfort of a home depends. The location and design of electric lighting fixtures are a favorite hobby upon which she must pass. She wants that home to be individualistic, attractive, and cheerful, and there are many things on which she alone is the most competent judge. Where will the bathroom be located? How will it be furnished? She knows how important these problems are from the health standpoint as well as the decorative angle.

The children—certainly a most important part of the whole structure. The chief responsibility of their care and training rests with the mother. In this important task the environment and atmosphere of the home is tremendously vital. As the woman shapes the every-day development of the family life, just so will she inevitably shape the destinies, to a large degree, of the young ones under her wing. Pleas-

(Continued to page 101.)



Woman Has Waved the Magic Wand to Make This a Dainty and Artistic Nook in a Happy Home. The Small Touches Here and There Which Stamp Each Home with Individuality Are the Results of the Housewife's Influence. She Gathers About Her Things That Are Beautiful and Refreshing.

How to Lay Linoleum Flooring.

DETAILS OF RECOMMENDED PRACTICE NOW FOLLOWED BY BUILDERS IN LAYING MATERIAL AS PERMANENT FLOORING IN ALL ROOMS, AS SHOWN ON PAGE 76

LINOLEUM is used as a flooring in practically every room in European homes because of the high cost of lumber. Within the last few years this idea has been gaining in popularity in America and manufacturers have prepared a series of patterns for the architect's use. These colors and patterns are designed to harmonize with the interior decoration of the new home and also to serve as a suitable permanent floor upon which to throw fabric rugs. Finding that much economy is possible thru the use of a cheap softwood base and a permanent linoleum finish, architects and builders are specifying this combination in plans for new homes.

The most satisfactory way to lay linoleum over concrete, wood or tile is to lay it over a layer of heavy deadening felt. Ordinary gray, unsaturated building or deadening felt can be used. It is pasted on the floor and the linoleum is then pasted to the felt and the seams and edges fastened down with waterproofing cement.

In laying linoleum the contractor should remove all dirt (plaster, dust, etc.), clean the surface thoroly, and then see that it is dry and smooth. A temperature of about 70 degrees should be maintained while the floor is being laid. After the felt is pasted to the base it is rolled with a 150-pound roller. The edges of the felt should be butted carefully and no ridges left under the linoleum.

Not less than 24 hours after the felt has been pasted in place the entire upper surface should be swept clean and the linoleum laid as follows: It should be accurately fitted to the walls and around the pipes and other projections in the floor. A paste or cement is then applied to the surface of the felt except for a space 4 inches in width at the points where the edges and joints in the linoleum fall. These spaces are left bare for later application of a waterproof cement. The linoleum is placed in position immediately after the cement is applied and then rolled thoroly with an iron roller until all air blisters are smoothed out. The seams of all printed and inlaid linoleum are made tight by butting the edges of the several strips closely together, care being taken to preserve the symmetry of pattern. After the waterproof cement has been applied at the seams and edges, the surface should be rolled thoroly and then weighted down by sand-bags, pressed bricks or other suitable weights. The illustration indicates how this is done.

Linoleum floors, like any floors, are only as good as they are laid. This is an axiom in floor laying. By cementing linoleum over a layer of deadening felt it is made permanent and will not buckle, stretch, nor creep. The felt foundation which is pasted to the sub-floor is intended to absorb the expansion and contraction that may take place in the wood or concrete base.

Linoleum flooring has been found useful and economical in offices, stores, hospitals, residences and public buildings and is now being used extensively in small homes because of its economical features.

It is manufactured in a wide variety of patterns to fit the color scheme and purpose of the room in which it is laid. For instance, a neutral tone is being specified in living and dining rooms because it makes an admirable and harmonious setting for a rug. Other designs are intended for kitchens, bathrooms and the like.

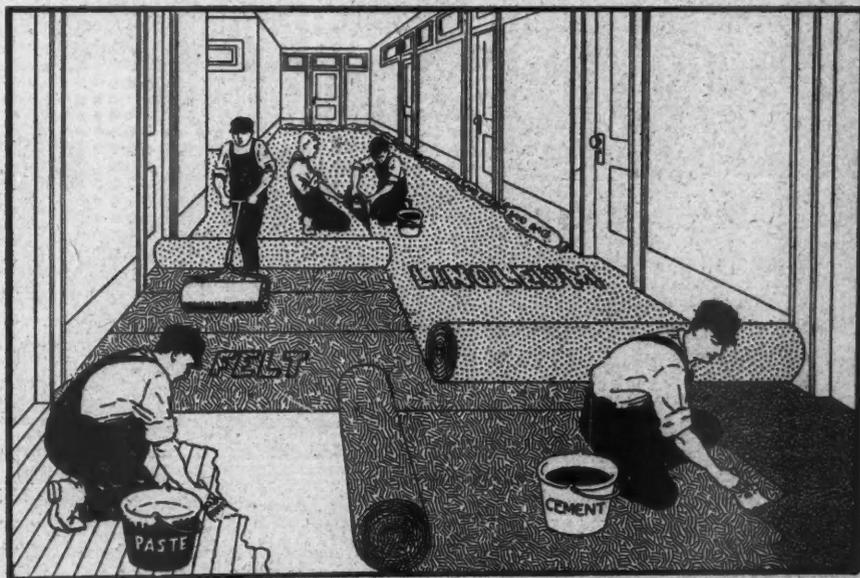


JUNE building contracts in western Pennsylvania, West Virginia, and Ohio, amounted to \$44,336,000, which was practically the same as the May figure.

During the first six months of the present year, 4,555 contracts were let, amounting to \$279,919,000, as against 5,361 contracts in the first half of 1919, amounting to \$141,264,000.

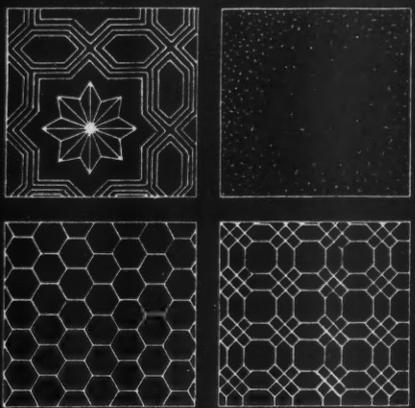
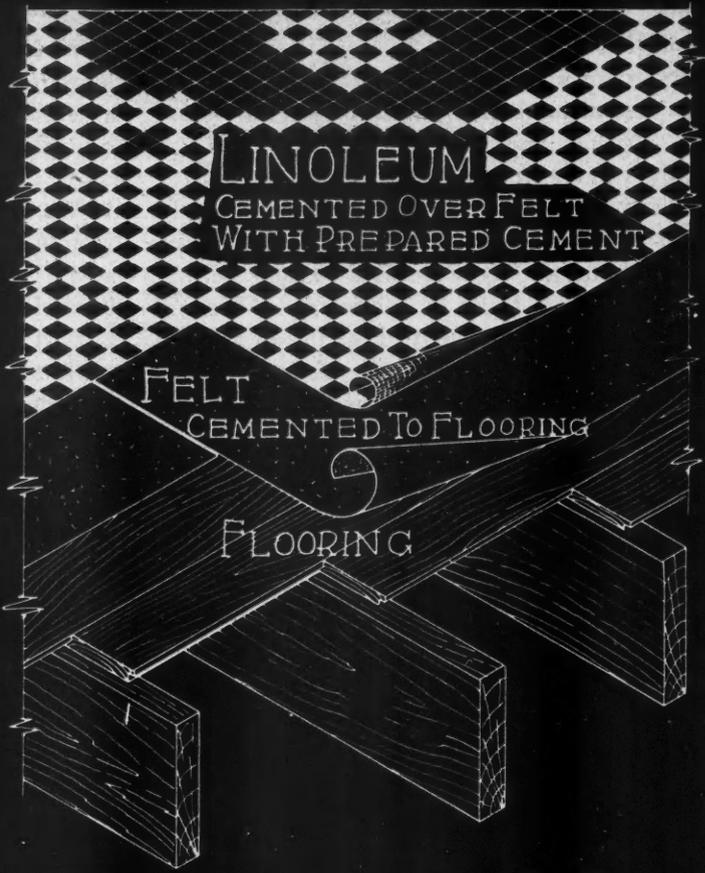
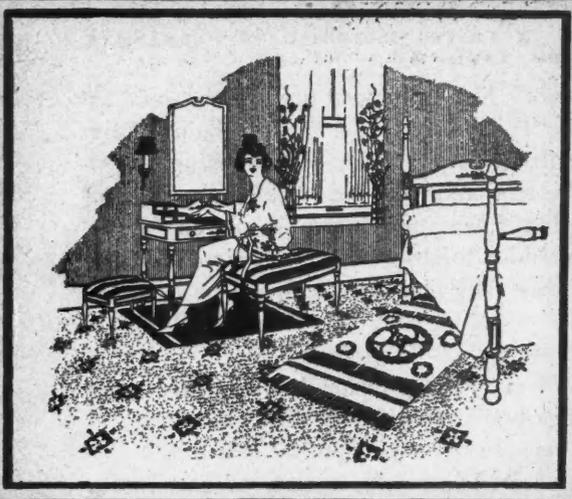
In this region, industrial building was in the lead. This class accounted for \$77,322,000, or 28 per cent of the total; public works and utilities amounted to \$72,247,000, or 25 per cent; residential buildings, \$63,371,000, or 23 per cent; business buildings, \$37,752,000, or 13 per cent.

Contemplated work was reported in this district from January 1 to July 1, amounting to \$343,000,000.



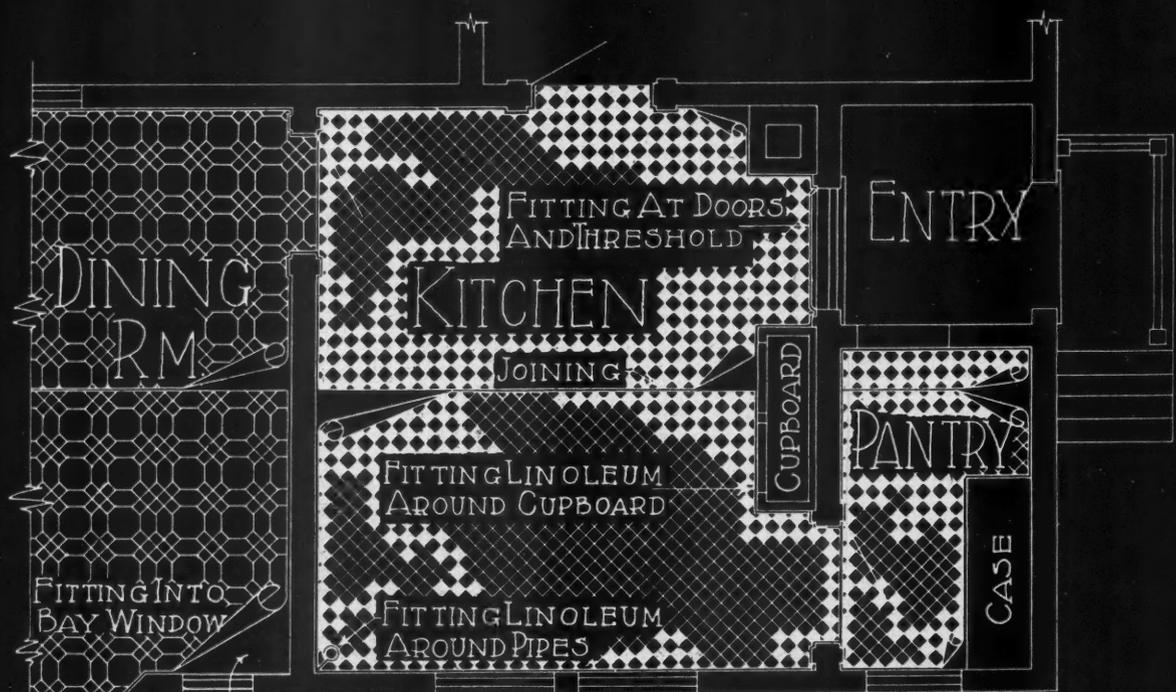
The Laying of Linoleum Is a Definite Process as This Sketch Reveals. It Is Now Being Used as a Permanent Floor Covering in Many Homes. Note How the Successive Layers of Material Are Applied.

RECOMMENDED CONSTRUCTION



LINOLEUM PATTERNS

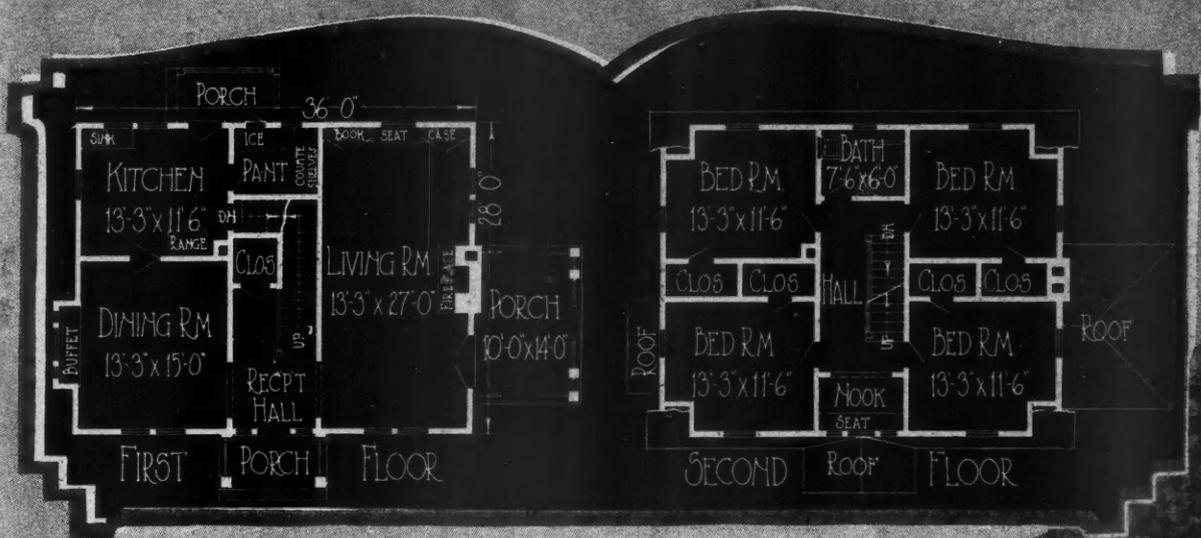
LINOLEUM CEMENTED TO FLOOR



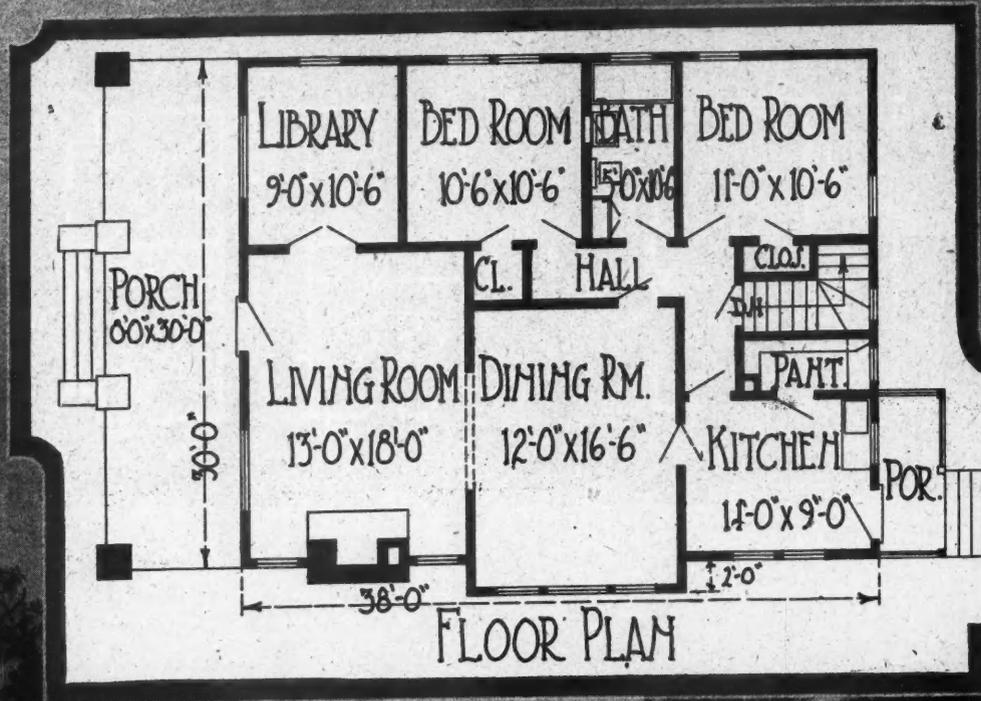
LAYING LINOLEUM

LINOLEUM FLOORING

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CHARMING DUTCH COLONIAL HOME. This type of house has about it a charm and hospitality that never fails to appeal. Built of frame with an attractive lattice effect on the lower story and drop siding above, it has distinctive roof dormers, arched in the center. The side entrance opens into a long reception hall. From this hall stairs lead direct to the upper floor while open doorways on either side give access to the large living room and dining room. The living room is 13 feet 3 inches by 27 feet extending the full depth of the house. Next to the doors opening out on the large side porch is the open fireplace characteristic of Colonial houses and along the rear wall are bookcases and a window seat. The kitchen is small and compact and well equipped. Linoleum floors, details of which are shown on the opposite page, have been used thruout. Upstairs four bedrooms with individual closets and a bathroom complete the floor plan of this very attractive home. Size, 36 by 28 feet.



DESIGN FOR A SIX-ROOM BUNGALOW. Here is a bungalow design that has a distinct appeal to the prospective home builder because it is good to look at, it is conveniently arranged and contains six good rooms, the right number for the average family. It is a frame building, set on a concrete foundation, 30 by 38 feet in size. The brick piers of the porch and the outside fireplace chimney laid up in an unusual way make this a good design. Living room, dining room and kitchen, all good-sized rooms, are ranged along one side of the house, while on the other side are library, opening off the dining room, and two bedrooms and bath. The floor plan shows the dimensions of the rooms. In both exterior and interior this is a most desirable bungalow.

Industrial Building Holds Lead

JUNE REPORT SHOWS INCREASE—OVER 22 PER CENT OF TOTAL FOR SIX MONTHS FOR RESIDENTIAL BUILDINGS

BUILDING operations in the month of June showed an increase of 6 per cent over the previous month, according to statistics compiled by the F. W. Dodge Company. Contracts awarded during June in the territory east of the Missouri and north of the Ohio rivers amounted to \$260,834,000.

A great increase in the volume of industrial building, and a decline in residential building have been the principle features of the building activity of the first half of the current year.

Contracts were let during the first six months of 1920 in the territory east of the Missouri and north of the Ohio rivers, numbering 31,308 and amounting to \$1,542,585,000, compared with 36,524 contracts in the first half of 1919, amounting to \$983,520,000. The decline in the number of contracts, taken in connection

with the enormously increased amount of money involved is an indication of the extent to which large scale operations have predominated this year.

Of the total for the first half of 1920, 26 per cent or \$399,830,000 was for industrial buildings, whereas during the year 1919, this class accounted for but 20 per cent of the total. About 22½ per cent of the total for the first six months of 1920, or \$348,580,000 was for residential buildings, whereas in 1919, this group comprised 33 per cent of the total.

Other important classes in the first half of 1920 were public works and utilities, amounting to \$324,748,000, and business buildings, amounting to \$269,604,000.

Altho contracts have been awarded amounting to more than \$1,500,000,000 dollars, there is still a vast amount of work held up for more favorable conditions.

Running Water in the Farm Home

BUILDERS ARE SPECIFYING TYPES OF WATER SUPPLY SYSTEMS SHOWN IN DETAIL ON PAGE 81

ONE of the most important considerations a builder has to deal with in constructing the modern farm or suburban home is water supply. Running water is demanded by clients and for that reason the progressive builder is now specifying a water supply system in his plans.

These water supply systems are made in a variety of types of which two are shown in detail on page 81. These types are the best known and most supply systems are operated on either one of these principles.

The air pressure or non-storage system as it is often called because the water is drawn direct from the well to the faucet consists of an engine or motor, a pump, and air storage tank, compressor and valve. The pump is placed in the water in the well, the rainwater tank or cistern, the spring or intake well which draws its water from a lake or running stream.

The equipment may be located in any building on the farm or in a special building constructed for that purpose. It does not necessarily have to be located in the well. The piping is installed in exactly the same manner as that of city homes.



Running Water is a Boon to the Farmer in More Ways Than One.



The Farmer's Wife Has Good Reason to Appreciate the Modern Water Supply System.

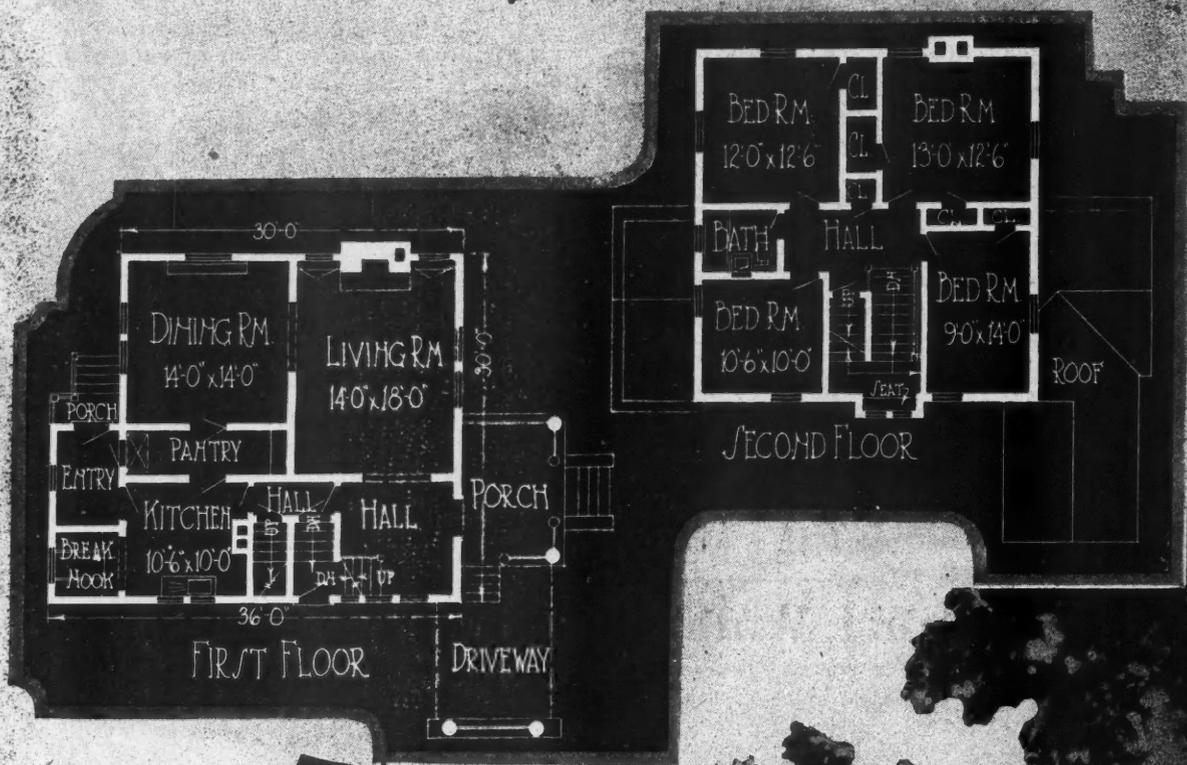
thru a feed pipe. On each stroke of the pump more water enters and is forced out by more air coming in on the other side. This results in a steady stream of water running thru the pipe to the faucet. This action continues until the faucet is turned off. In case

the supply of air in the tank gets low the air compressor starts working and fills it up again.

The water pressure system is generally known as the storage system because water and air are forced in at the same time into a storage tank. When the water and air are pumped into this tank the air becomes compressed and forces the water out thru the house pipes. When the faucet is turned on, the water immediately starts to run. This system is automatically controlled so that when the pressure goes below a certain point, the pump starts work automatically and brings the pressure up to the maximum, then stops again. Under this arrangement water is stored under pressure in the tank at all times.

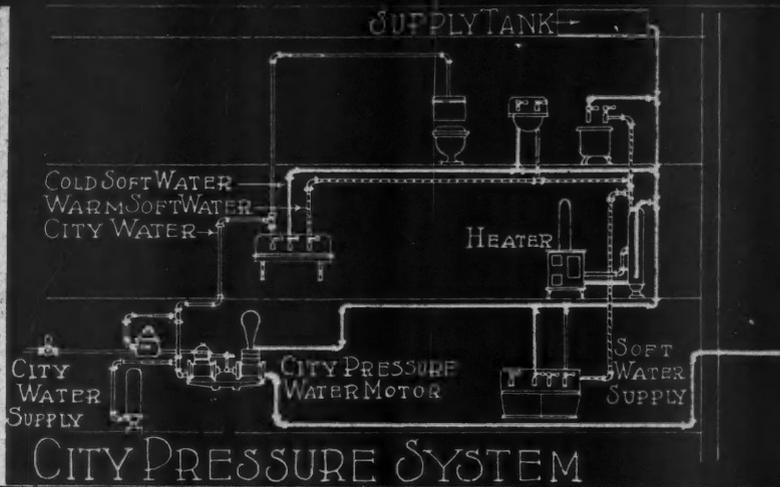
A type of rainwater supply system which is often incorporated in the plans of suburban homes where there is city pressure is shown in detail on page 81. In this system a pump is installed in the basement of the house in connection with a water motor. This motor is placed so that the water from the city main will operate it. It in turn pumps the soft water which supplements the house supply.

Modern Farm Home with Water Supply System Details

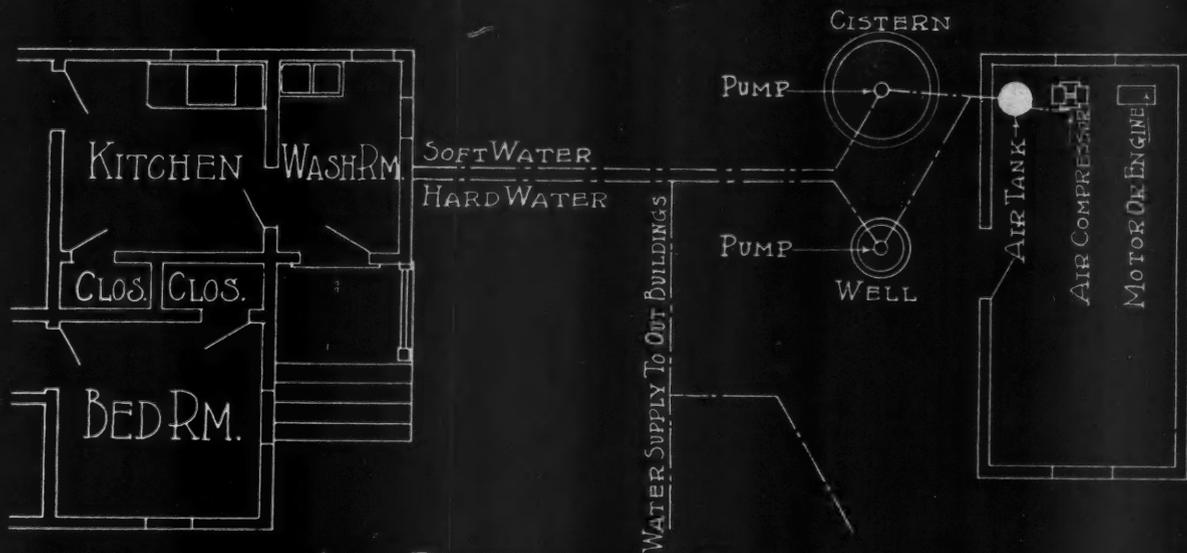


SUBSTANTIAL AND MODERN FARM HOME. Too often the home on the farm is neglected, but in this case the farmer has not overlooked any of the modern improvements which help to make up a real comfortable and attractive home. It is lighted with electricity, furnished by an electric lighting plant, and has a real bathroom with running water, pumped by a water supply system, along the lines shown on the opposite page. On the first floor are three rooms, living and dining rooms and kitchen. In the living room is one of those cheerful open fireplaces to brighten up the home in the winter months. Four bedrooms are on the upper floor and a bathroom. Note the attractive driveway leading to a garage in the rear. This house is 30 by 36 feet.

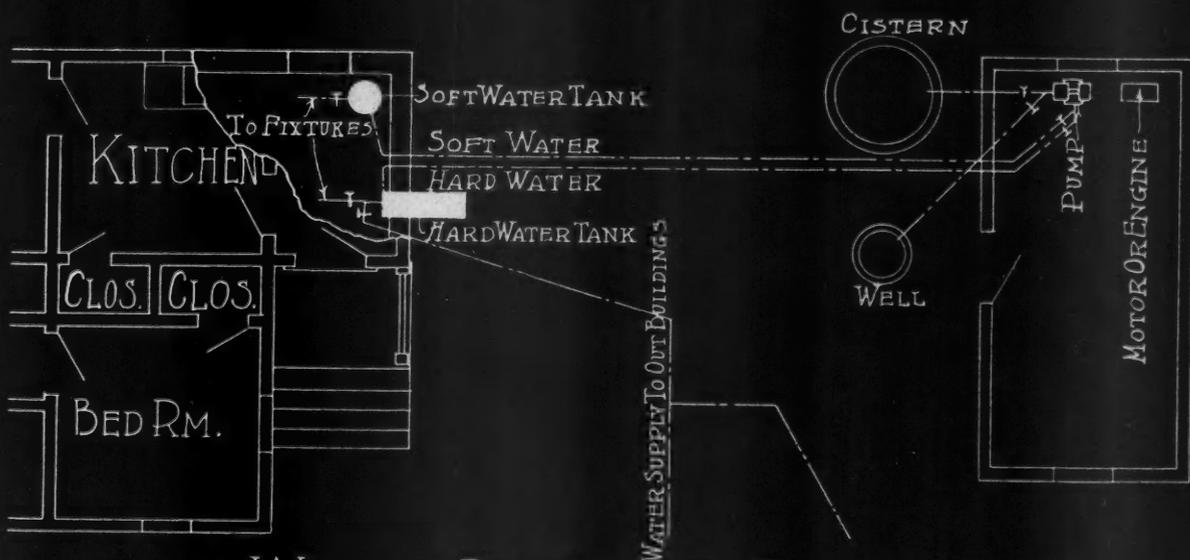
RECOMMENDED CONSTRUCTION



CITY PRESSURE SYSTEM



AIR PRESSURE SYSTEM



WATER PRESSURE SYSTEM

WATER SUPPLY SYSTEMS

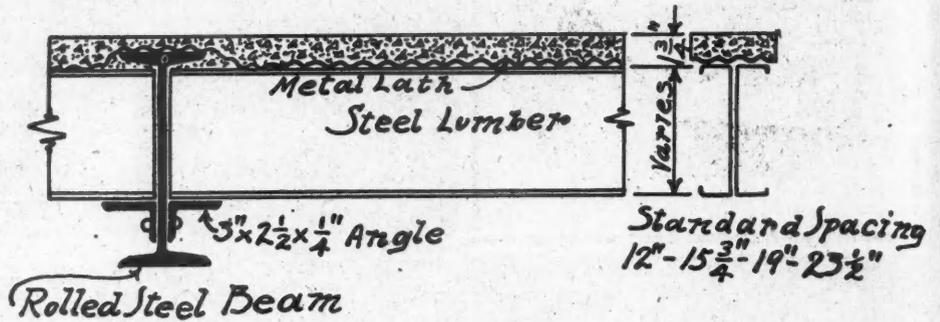
Steel Lumber Intact After 60 Years

DEMOLITION OF OLD BANK BUILDING BUILT IN 1855 REVEALS STURDY STEEL JOISTS.

By Gilbert Canterbury

WE ARE accustomed to think of steel lumber floor construction as something entirely new, both as to design and material used. The demolition of an old building in New York City, however, has divulged the fact that the design and nearly identical material were used successfully before Abraham Lincoln was elected to the presidency. Examination of materials uncovered in this ancient structure also throws light on the recurrent question regarding the permanency of steel joists and studs.

who also designed Grace Church and St. Patrick's Cathedral in New York, as well as other noted buildings. At the time The Bank of the State of New York Building was erected, Mr. Renwick was in the middle



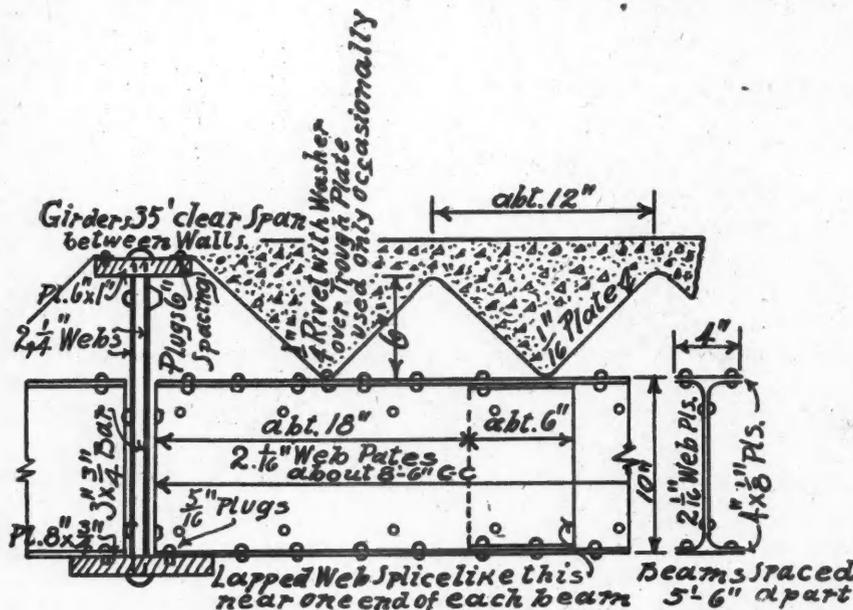
The building in question was known as The Bank of the State of New York Building, and it occupied the northwest corner of Williams Street and Exchange Place in lower Manhattan, extending about 40 feet north on Williams Street and about 90 feet west on Exchange Place. It was five stories high above the ground and had in addition a basement (half above ground), and a low attic story. The outside walls were brick, with marble facing on street frontages. The floors were of full iron framing, with a sheet iron trough-plate leveled up with concrete to support wooden floor boarding.

of his career as an architect and engineer.

The building was erected during the year 1855 or 1856. At that time riveted wrought iron construction was in its infancy, hardly more than a thing of the future. Rolled wrought iron "I" beams had just been invented. The architect was the late James Renwick,

The work of removing the building was done recently by the New York House Wrecking Company. A modern steel skeleton building twenty-five stories high has been erected on the site by the Thompson-Starrett Company. The earliest installations of the modern steel lumber joist were in 1906 and it has only been during the last few years that this material has been manufactured on a mill or quantity basis. Yet steel joist floor construction was used thruout The Bank of the State of New York Building and when it was demolished the joists, after a half century of use, were found to be in a splendid state of preservation. Rust, where it was to be found at all, was only incidental.

A sketch showing dimensions and typical arrangement of girders, beams and floors indicates how closely this ancient example conforms to the present day steel lumber type of construction. The floor joists consisted of an upper and a lower flange-plate, each 4 inches wide by 1/8 inch thick, united by two web-plates 1/16 inch thick, bent outward horizontally at the top and bottom to form an I-shaped section 10 inches deep. Except for the crudities of fabrication, these steel joists are almost exact duplicates of the standard 10-inch steel lumber joists of the present day.



The web-plates and joist removed from this old building were held together in close contact by two rivets every 6 inches in the length of the beam. Virtually a single web was thus formed. The flange-plates were fastened to the horizontal

Sketch Showing Dimensions and Typical Arrangement of Girders, Beams, and Floor in Old State Bank Building Recently Demolished in New York City. It Was Built in 1855 of Steel Lumber Construction.

edges of the web-plates to one row of rivets in each edge of each flange. The steel framing of this building was entirely of wrought iron and the general arrangement of the framing conforms very closely to modern practice. The girders were riveted, a form of construction that was current for a decade or so, but it passed out of use over sixty years ago. The troughing floor-plate is also interesting, since it represents probably the earliest use of a form that has come down even to the present, with only very slight modifications.

There were no interior columns in this building. Riveted iron plate-girders 18 inches deep of I-shaped cross-sections spanned from wall to wall transversely of the building, about 35 feet in the clear. They were spaced about $8\frac{1}{2}$ feet apart and formed the main floor supports. Transversely between these girders and resting on their bottom flanges were the first examples of steel lumber joists. The joists were spaced $5\frac{1}{2}$ feet apart. In some cases they were fastened to the girders by two small iron rivets thru the bottom flanges and in other cases they were set on in precisely the same way that steel lumber is used today. Corrugated floor-plate of thin wrought iron was laid over these 10-inch joists, the corrugation running trans-

versely to the joints and parallel with the main girders, thus spanning the $5\frac{1}{2}$ feet between the joists. The depth of corrugation was about 6 inches. The floor was leveled up with concrete about 2 inches deep over the tops of the corrugations. Wooden flooring was laid on this concrete filling and nailed to nailing strips imbedded in the concrete. The ceilings were of lath and plaster fastened to studding framed closely around the iron-work. This, of course, was long before the days of steel lath and common wood lath was used in this construction. All of the iron-work appeared to have had two coats of paint, tho it was especially noticeable that the joists had been more poorly painted than the other members. It was also noted that the joists were surrounded by an air space, as well as girders and beams, and that the trough-plate also faced this air space.

George M. Cohan once wrote a song entitled "There is really nothing new beneath the sun." The demolition of The Bank of the State of New York Building shows clearly that expert craftsmen of old Manhattan made use many years ago of what has been generally accepted as a thoroly modern firesafe and permanent type of constructon.

Sheet Metal--Tin Roofing

DETAILS OF THE TYPE OF ROOFING AND FLASHING SHOWN ON PAGE 85

SHEET metal or tin roofing, as it is popularly known, is broadly divided into four classes—ribbed, V-crimped, standing seam and flat seam. There are other variations but these types mentioned are the most widely used.

V-crimped roofing may be applied to sheathing boards or lath or directly over old shingles without removing them, if roof trusses and nailing will permit. The nails are driven directly thru the roofing sheet, the triangular strip, and sheathing. Therefore it can be fastened down more firmly than some styles of plain roofing and is very popular in windy sections. In placing these sheets on the roof these crimps lap over each other and also over a triangular strip of wood which serves to support the joints and braces the sheets firmly.

When applying this roofing, always allow the roofing sheets to project one inch over the eaves and then bend this projection down against the wood framework, nailing it fast to prevent wind and water from blowing underneath. This type of roofing is used on roofs of pitches greater than two inches to the foot.

For flat roofs the standing seam type is most frequently used. This roofing is simple to apply as it is laid without the use of cleats or other patent fastenings. Begin at the left hand end of the roof at the eaves. Let the lower edge of first course sheets project over the eaves one inch, afterwards bending them down and nailing fast to the sheathing boards. Make a point on the upper end of sheet by turning lock with tool, then place the cleats along the single

seam or flange, about one foot apart; join on another sheet the same way, turn locks at upper ends of sheets up, those at lower end down. The detail on page 85 shows this very clearly.

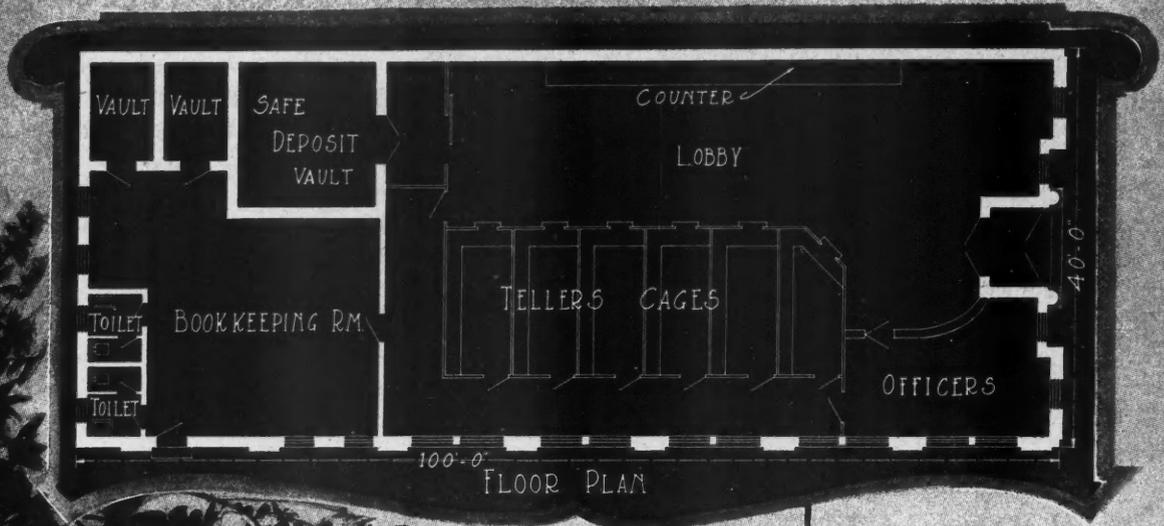
Break joints in laying by using short or half length sheets to start every other course from eaves to ridge. When the comb or ridge is reached allow $\frac{3}{4}$ inch to turn up at the top which is done by using the jointer, snip the flange $\frac{3}{4}$ inch then turn it up and put cleats about a foot apart. The ridge should be finished with capping or ridge roll.

For roofs having a fall of only one or two inches per foot long sheets of roll metal roofing are often used. These strips are manufactured in lengths of fifty feet or more. In this type, it is best that the rafters be sheathed over entirely. Begin at either side of the roof turning down the outer edge of the roll and nail to the face board or flash up against the wall as the case may be.

Nail the cleats down to the sheathing at intervals of about twelve inches along the flanges of roll first laid, so there will be a cleat at center end of each cap, and after forming the flanges on the next roll, place it so that the flanges of the two strips touch, and are in a straight line.

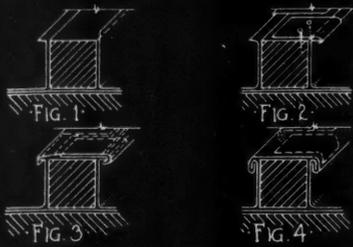
The flat seam type is very similar to the standing seam with the exception of the seam which is hammered down flat after the cleat has been fitted over nails.

In the ribbed roof type the metal is applied to the roof between the ribs as shown in the detail.



IMPOSING BANK BUILDING OF MODERN DESIGN. This substantial looking structure gives an impression of security and confidence, two very desirable qualities for the home of a banking business. Built of brick, it has been enhanced by attractive terra cotta trim, large windows, protected by ornamental iron gratings on the lower floor, and a very imposing entrance. It is 40 feet wide and 100 feet long. The ceiling is high, giving plenty of air and light to the banking floor, which has been divided into the various departments of a complete banking institution. A long lobby with counter for customers and tellers' cages form the front part of the bank, while safe deposit and other vaults, and bookkeeping rooms are found in the rear.

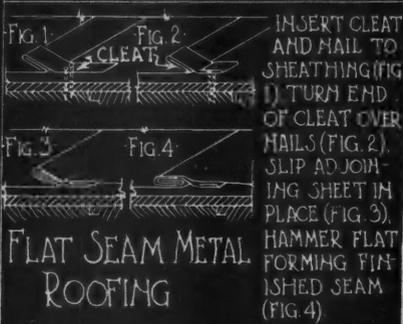
RECOMMENDED CONSTRUCTION



TRIBBED ROOFING

APPLY METAL TO ROOF BETWEEN RIBS & TURN UP TO STAND $\frac{1}{2}$ " ABOVE HEIGHT OF RIB (FIG. 1) TURN THE $\frac{1}{2}$ " OUT TO RECEIVE CLEATS ONE FOR EACH SIDE MAILED TO TOP OF RIB (FIG. 2). CAP IS CUT 4" WIDE & TURNED $\frac{1}{2}$ " ON EACH SIDE & HOOKED TO ROOFING METAL (FIG. 3), LOCK AGAINST SIDES OF RIB (FIG. 4). END IS FINISHED WITH METAL APPLIED SIMILARLY TO CAP.

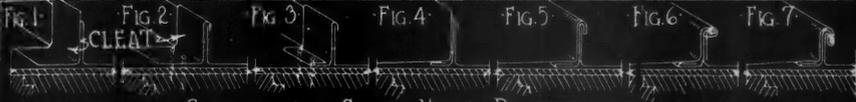
COMBINATION RIB & STANDING SEAM



INSERT CLEAT AND MAIL TO SHEATHING (FIG. 1) TURN END OF CLEAT OVER MAILED (FIG. 2). SLIP ADJOINING SHEET IN PLACE (FIG. 3), HAMMER FLAT FORMING FINISHED SEAM (FIG. 4).

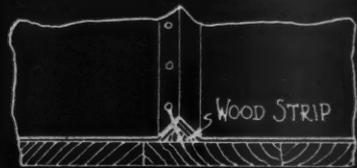


FLAT SEAM METAL ROOFING

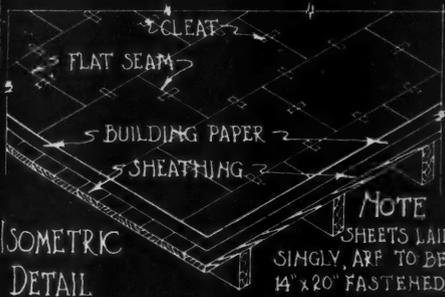


STANDING SEAM METAL ROOFING

LAY SHEETS WITH ADJOINING EDGES TURNED UP (FIG. 1), MAIL CLEATS TO SHEATHING 8" APART (FIG. 2), TURN END OF CLEAT OVER MAILED (FIG. 3) PLACE ADJOINING SHEET IN POSITION (FIG. 4) TURN TOP EDGE OF SHEET OVER (FIG. 5) STARTING "LOCK". THE LOCK IS AGAIN TURNED (FIG. 6) TO FINAL POSITION (FIG. 7).



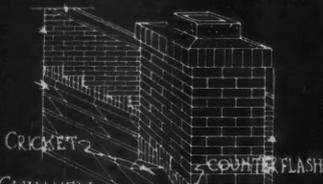
V-CRIMPED ROOFING



ISOMETRIC DETAIL

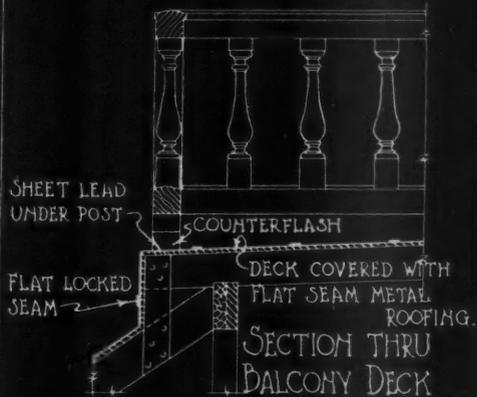
SHOWING METHOD OF APPLYING METAL IN SHEETS LAID WITH FLAT SEAMS.

NOTE SHEETS LAID SINGLY ARE TO BE 14" x 20" FASTENED TO THE SHEATHING BY MEANS OF CLEATS USING THREE TO EACH SHEET.



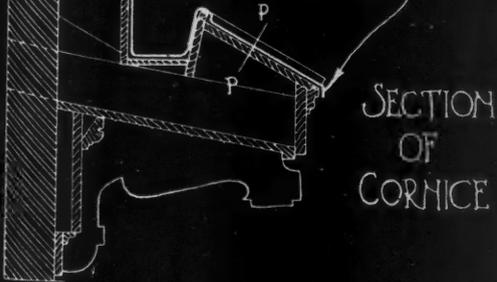
CHIMNEY FLASHING

FLASHING IS FORMED BY TURNING ROOFING METAL UP AGAINST ALL MASONRY AT LEAST 3". COUNTERFLASHING IS BUILT INTO JOINTS OF MASONRY AND TURNED DOWN OVER FLASHING.



SECTION THRU BALCONY DECK

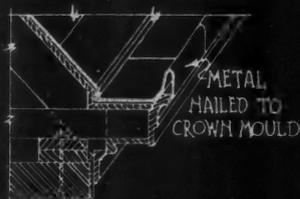
METAL COVERED RIBS $1\frac{1}{4} \times 3\frac{1}{4}$ " - 2'-0" C. TO C.
ROOFING METAL TURNED DOWN OVER TOP OF CROWN MOULDING AND MAILED.



SECTION OF CORNICE

SHOWING APPLICATION OF RIBBED METAL ROOFING & BUILT IN GUTTER.

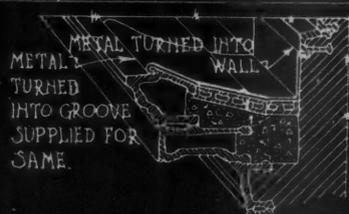
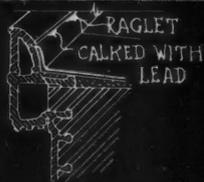
SECTION P-P



VALLEY GUTTER



V-TYPE GUTTER



FORMING GUTTERS ON TERRA COTTA COURSES

SHEET METAL (TIN) ROOFING

Attractive Story-and-a-Half House

SUBSTANTIAL FRAME STRUCTURE HAS PLEASING EXTERIOR AND EIGHT COMFORTABLE ROOMS.

AS THE average man builds a home but once in a life time it behooves him to give the matter careful thought. Moreover, as he is inexperienced in the details of construction he places almost implicit confidence in the builder and what the latter recommends. The latter is the advisor who suggests and gives facts about building homes. Naturally much of his success depends on how he fulfills this mission.

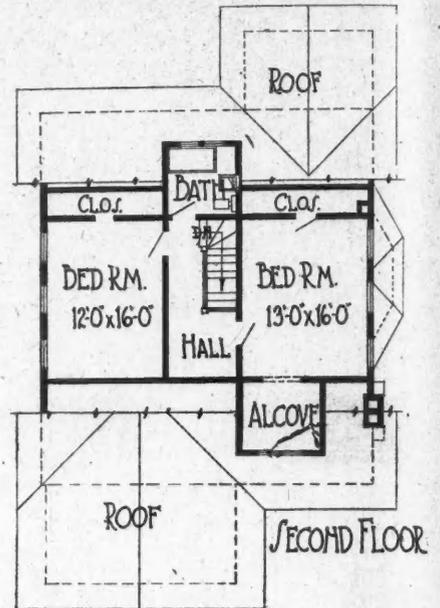
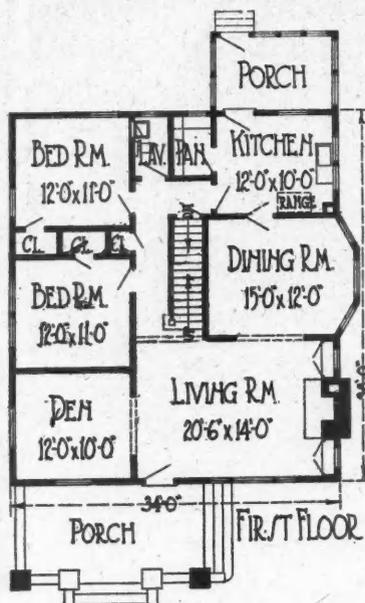
In the picture of the story-and-a-half home shown on this page, you will find the result of conscientious work on the part of the contractor. He has built a substantial and comfortable home that will last and satisfy. The exterior is particularly pleasing and built along lines somewhat distinctive. The front porch with side and front stone steps and heavy brick columns and gable roof is well constructed and inviting.

The projecting rafters and small roof dormer set rather far back under a projecting roof which is supported by three small braces, are additional touches that make the home look very appealing.

It is built of frame, part siding and part shingles. The foundation is concrete.

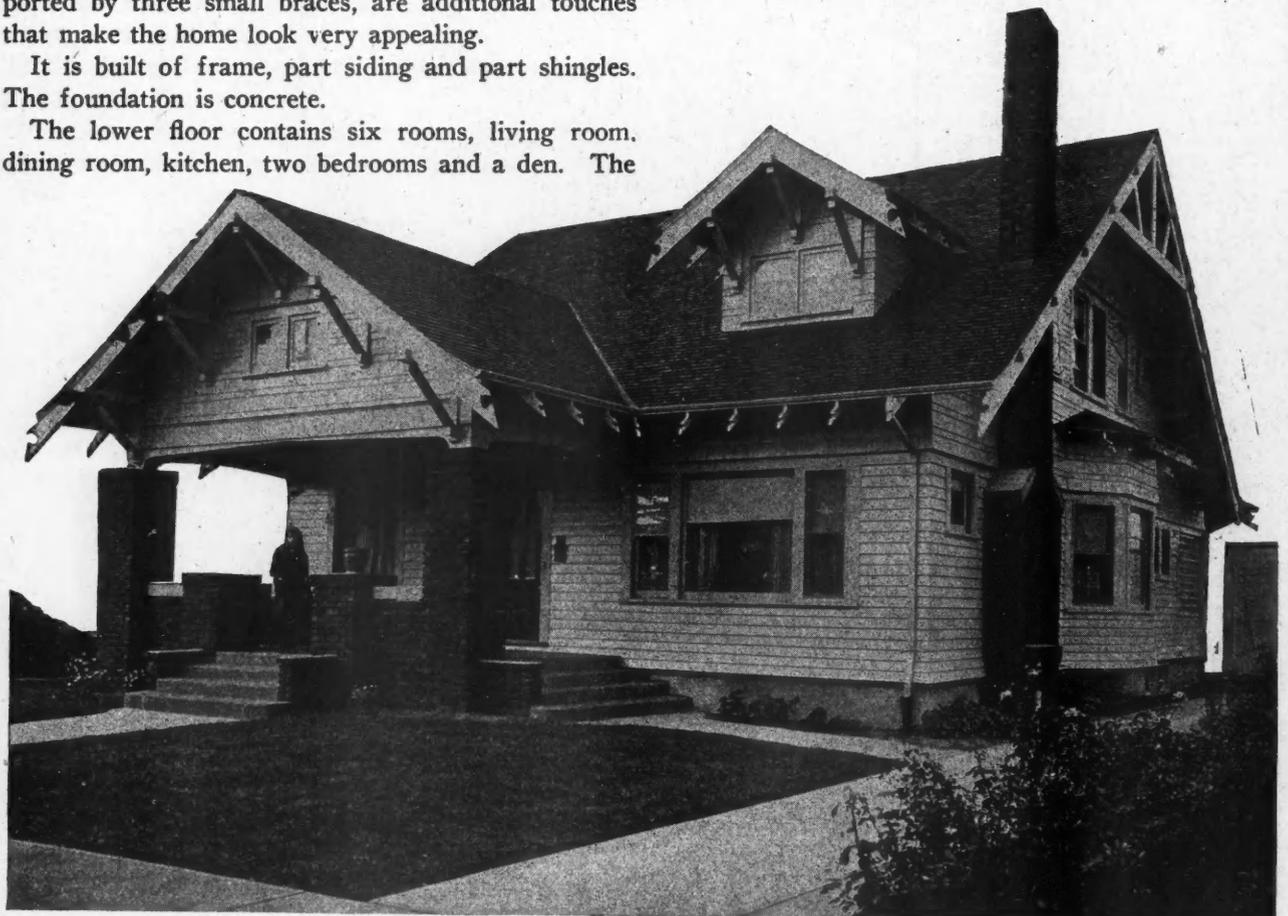
The lower floor contains six rooms, living room, dining room, kitchen, two bedrooms and a den. The

living room is the largest room in the house. At one side is the open fireplace which is in such popular demand just now. Wall book cases have been built



Arrangement of First and Second Floors in Story-and-a-Half House. It Contains Eight Rooms.

on each side of it with small windows above. This room is 20 feet 6 inches by 14 feet.



Well-Designed Story-and-a-Half House Containing Many Features That Will Prove Attractive to the Prospective Homeowner. The Floor Plans Provide for Four Bedrooms and a Large Living Room with Open Fireplace. This Home is 34 by 38 Feet.

The den, which is a small room, 12 by 10 feet, opens off the living room. It can be used as a library.

The dining room, located to the rear of the living room, is 15 by 12 feet and well lighted by a bay window. Two bedrooms, 12 by 11 feet, are located on the other side of the lower floor.

In the half story are located two large bedrooms and a bathroom. They are 12 by 16 feet and 13 by 16 feet in size. The larger one also has a small alcove extending out in the dormer which is located over the living room. Two long closets have been built at the end of each bedroom to use up some of the space which is ordinarily wasted in the half story of a house of this type. They have been built under the slope of the roof.



Economy in Lengths, Sizes and Quality of Lumber

SINCE labor has become a most significant factor in the cost of building, and since there are certain established standards of lengths and sizes, as well as significant differences in grades of lumber, it is im-

portant that the use of these standard lengths, sizes and grades be intelligently applied to the design of buildings for the purpose of reducing the cost of construction where possible.

In designing the floor plan of a building, the fact that standard lengths of joists are multiples of two feet, 4 feet to 24 feet inclusive, should be an important consideration in determining the widths and lengths of each room.

Odd lengths, such as joists 9, 11, 13 and 15 feet, not commonly carried in stock, are charged as the next longer even length and cut at the lumber yard before delivery, or delivered in the next longer even length, necessitating cutting by the carpenter on the job. The waste here is obvious, both in material and in labor, and could easily be avoided by careful design.

A building does not necessarily have to be an even number of feet in width in its over all dimension. Take, for example, a brick building, which is built 24 feet with 12-inch walls. Joists which are 24 feet long can be used, but at least 16 inches must be cut from the ends to have the proper extension of the joist ends in the brick wall.

Steel Lumber Construction

LIGHT IN WEIGHT AND INSTALLED LIKE TIMBER JOISTS, ECONOMICAL IN COST—DETAILS SHOWN ON PAGE 88

ONE of the most interesting developments in the construction field in the last few years has been that of steel lumber. It has proved very popular because of its fireproof qualities and economy, being practically as cheap as other material used for joist and partition work. Manufacture of this product has advanced to a point where it is produced on a quantity basis and is now being sold like lumber.

It is about the same weight as timber joists and has the same bearing power. The striking feature of it is that it can be laid by anyone acquainted with the principles of joist construction and does not require special riveting or bolting. In short, steel lumber construction is a combination of steel joists, metal lath and a thin concrete slab. These steel joists are made by welding two channels back to back. In floor construction these I beams are placed on edge. The only variation in this type of lumber and the wood joist is the addition of flanges for fastening floor and ceiling finishes.

It can be sawed and fitted similar to wood joists, or is furnished by the fabricator in exact lengths ready to be set. All that is required in an ordinary job is two men. The low cost of this steel lumber is one of its features. It never weighs over 40 pounds per square foot dead load, while other types of fireproof construction often weighs at least fifty per cent more. The economy of this material is evident. Not only from handling costs but in material for lighter dead loads on beams, walls, etc., permit economy in material used.

Steel joists are furnished in standard sizes ranging from 4 inches in depth, weighing 4½ pounds to the linear foot, to 10 inches in depth, weighing 8 pounds to the linear foot. The width across the flanges is 4 inches in 10, 9 and 8-inch joists; 3½ inches on the 7-inch joist and 3 inches on the 6, 5 and 4-inch joists.

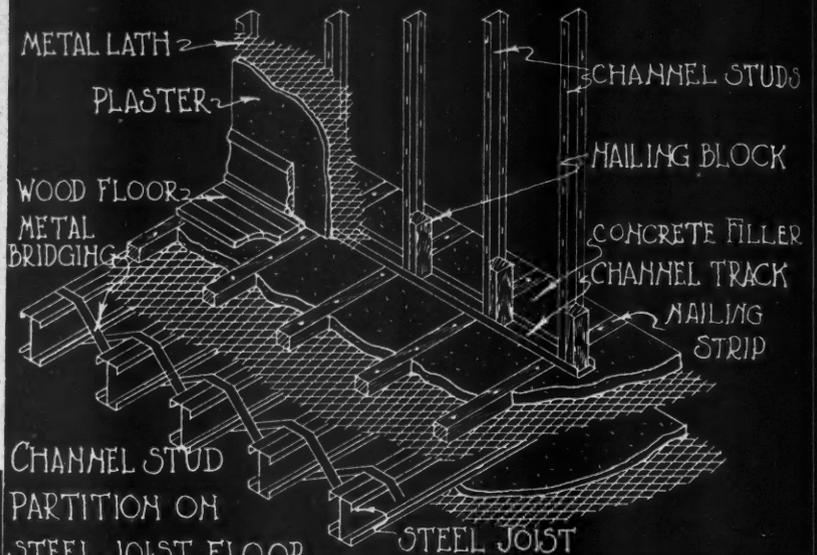
A common type of construction is to erect the outside walls of brick or bearing tile and use structural rolled steel columns and beams to support the interior end of the joists. Steel lumber joists are adaptable to any combination of supporting material including masonry bearing walls, steel stud bearing partitions, rolled steel columns, or reinforced concrete columns and beams.

Over the joists a layer of sufficiently heavy metal lath is placed as a centering and reinforcing for a thin concrete slab. Under the joists a similar metal lath reinforces and supports the plaster ceiling. Steel joists are made up of two symmetrical channel sections placed back to back and welded together.

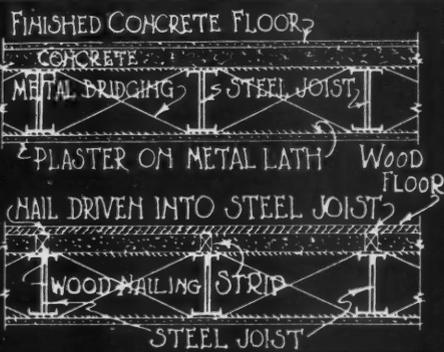
Where wood floor finish is specified a 1¾ by 1¾ screed or nailing strip is to be placed on top of the lath, parallel with and centering over the joists. This screed is to be securely nailed to the web of the joists at frequent intervals with 12d nails. The floor filling is then tamped slightly below the surface. Wood flooring is nailed directly to the screeds.

In no case should joist be spaced more than 23½ inches c-c. In roof construction where metal lath and a concrete slab are used above the joists the joists should not be placed more than 30 inches.

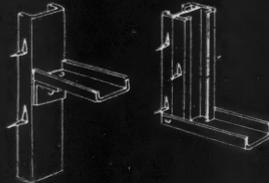
RECOMMENDED CONSTRUCTION



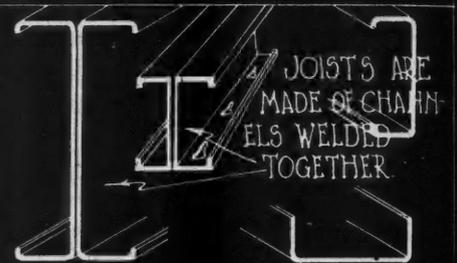
CHANNEL STUD PARTITION ON STEEL JOIST FLOOR CONSTRUCTION.



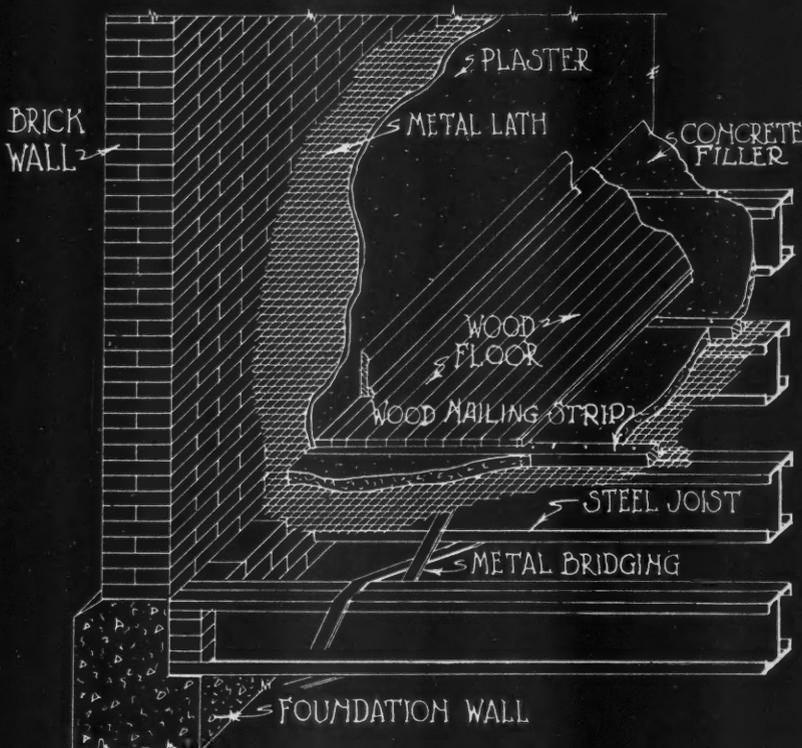
STANDARD FLOOR CONSTRUCTION



STEEL STUD CONNECTIONS

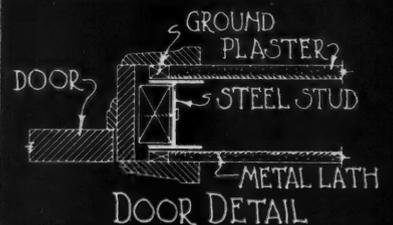


STEEL JOISTS

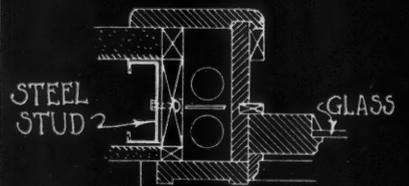


DETAIL OF STEEL FLOOR CONSTRUCTION

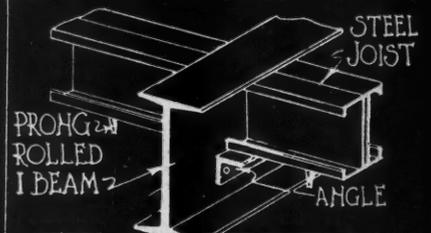
STEEL LUMBER



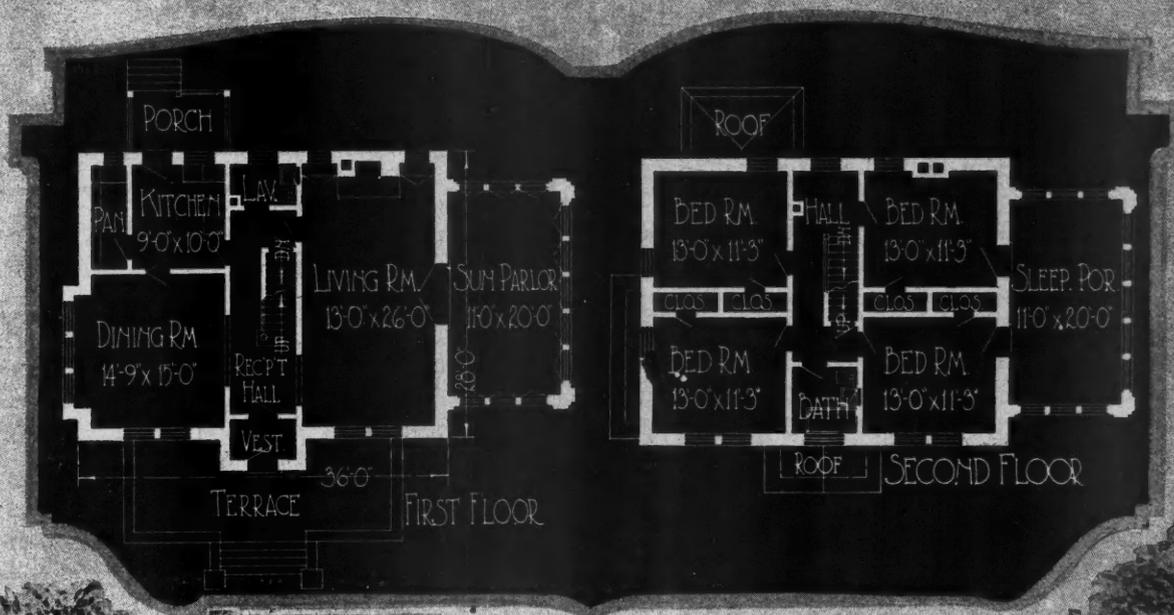
DOOR DETAIL



WINDOW DETAIL



STEEL JOIST SUPPORTED BY ANGLE RIVETED TO WEB OF STEEL I BEAM.



SUBSTANTIAL BRICK HOUSE WITH ORNAMENTAL ROOF. There is a certain massiveness about this fine looking home that indicates stout fire-safe construction. The floor joists are steel lumber of the type shown in detail on the opposite page. The walls are of brick with pressed brick exterior, while an ornamental tile roof adds another touch to its solid appearance. The terrace and front gable-roofed entrance are quite attractive. The double sun parlor sleeping porch with its heavy tile roof is in harmony with the rest of the home. Three rooms, living room, dining room and kitchen are on the first floor and four bedrooms are on the upper floor. The living room is large and opens out on the sun parlor thru French doors. Size 36 by 28 feet.

The "Simplicity House"

ALABAMA REALTY FIRM DEVICES UNIQUE PLAN TO ENCOURAGE HOME OWNERSHIP

By Mrs. J. N. Cornelius

WOULD-BE home owners are willing to go back to the old American ideals of simple living and working toward the goal of their ambitions, may realize their dreams by following a plan recently inaugurated in Birmingham, Ala.

The plan is this: The Birmingham Realty Company sells a lot in either of three fashionable residence sections, and erects on the rear of this lot a simple and attractive house, which the owner may occupy until such time as he is able to build his permanent home on the front of a lot. The little house may then be converted into servant's quarters and garage by the removal of one partition.

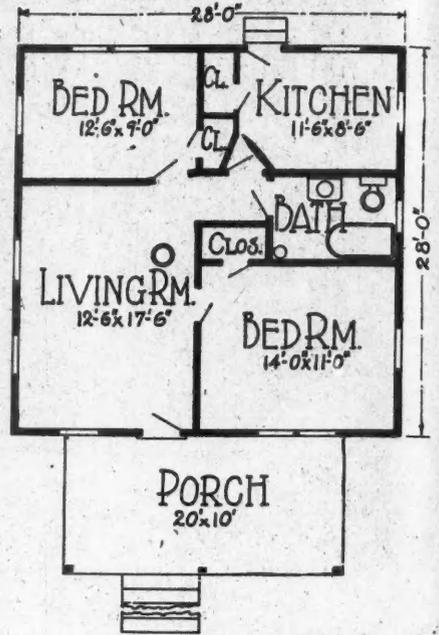
The house costs \$2,250 and the lots range in price from \$2,000 to \$6,000. There is an initial cash payment of \$750 and the balance is paid in monthly installments of \$50 up, based on the price of lot.

The total payment per month on house and lot, including interest, taxes and insurance, is less than the rent for a like amount of space in any equally good neighborhood in the city.

The house is of logical design and honest construction, and while the owner may use his own taste as to finish and other minor matters, he must stick to the simplicity idea and use the plans furnished by the realty company's architect, thus avoiding any possibility of the house becoming one of those architectural horrors that so often start a whole city block on the way to ruin.

Each contract contains a clause providing that the plans for the house that is ultimately to be built on the

front of the lot must be approved by the realty company. This is, of course, essential to the protection of other property owners in the neighborhood. The plan is proving immensely popular and many erstwhile apartment dwellers are already happily at home in their "simplicity houses," and when the stress of the present abnormal cost of building construction has passed they will be ready to build their house of dreams.



Floor Plan of "Simplicity" Cottage.

Building in the Northwest

JUNE building contracts in Minnesota and North and South Dakota amounted to \$7,218,000, which was somewhat of a decline from the May figure.

The total for the first half of the present year amounted to \$54,324,000, representing 1,937 contracts.



The "Simplicity" Cottage. A Unique Idea Introduced by a Birmingham, Ala., Realty Concern That Is Endeavoring to Stimulate Home Ownership by Putting the Cost Within the Reach of All. In event of Prosperity This House Will Make a Good Garage. It Is Built in the Rear of the Lot.

How a Builder Won Success

BORT DISCOVERS A PROFITABLE BUILDING BUSINESS IN MAKING FARM APPLIANCES

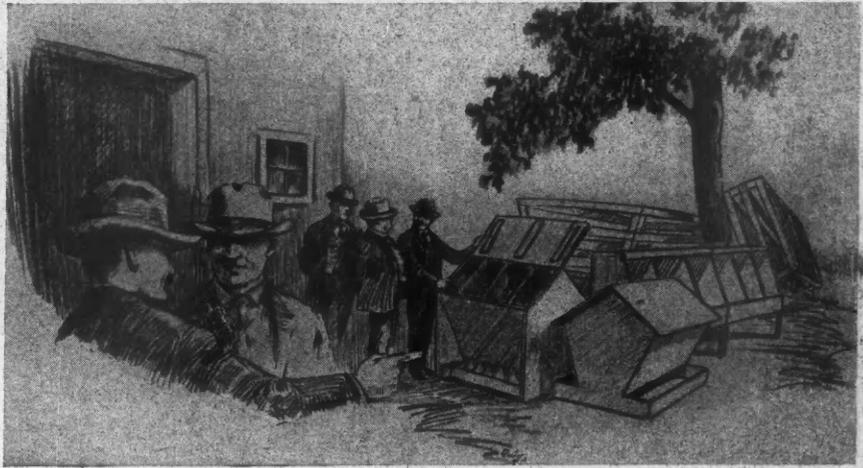
By E. V. Laughlin

WHEN F. A. Bort, Hopkinton, Iowa, announced to the farmers of his community that he would soon be prepared to build their wagon racks, animal crates, self-feeders, and the like, most of them smiled condescendingly and evasively told him they would drop in whenever they needed anything. Out of his hearing they remarked that they didn't have to hire anyone to build such things—that they could build them themselves. They predicted that Bort would't last long in the building business. "Won't get enough business to pay his book-keeper," one farmer was heard to remark derisively.

Bort believed, however, that there was an opening for such a business in a small Iowa community surrounded by a rich farming country. He had been a farmer himself and he knew that when a farmer gets in a hurry for farm equipment he gets in an awful hurry. So he set about equipping an old livery stable. He had a lot of lumber sawed on a farm nearby that he owned. He entered into an agreement to give a carpenter work for at least a year whether he got any business or not. Soon he had a number of wagon racks and self-feeders on exhibition marked *FOR SALE*. The prices were figured to cover all expenses and about ten per cent of profit. Farmers who examined them soon discovered

that these articles could be purchased for only a little more than the material would cost. As a result the single carpenter was soon unable to take care of all the orders. Two other local workmen were added to the force. These, too, soon had all they could do.

It was just stated that Bort knew farmers and their need from having been a farmer. In addition



When Bort, the Contractor in Hopkinton, Iowa, Started Making Feeding Crates and Other Accessories for Farm Trade, the People Laughed at Him. Today He Can't Handle All His Business.

to being observing he is ingenious. An idea came to him. It was the construction of a combination wagon rack that would do for hauling grain, hogs, cattle, and wood; and which could thru a few twists and turns be made into a hay rack. Today practically every farmer within five miles of Hopkinton owns one of Bort's combination racks.

Installing Hoghouse Roof Windows

ROOF WINDOWS MAKE HOG HOUSES HEALTHY AND CHEERFUL HOMES FOR ANIMALS—DETAILS OF INSTALLATION SHOWN ON BLUEPRINT, PAGE 93

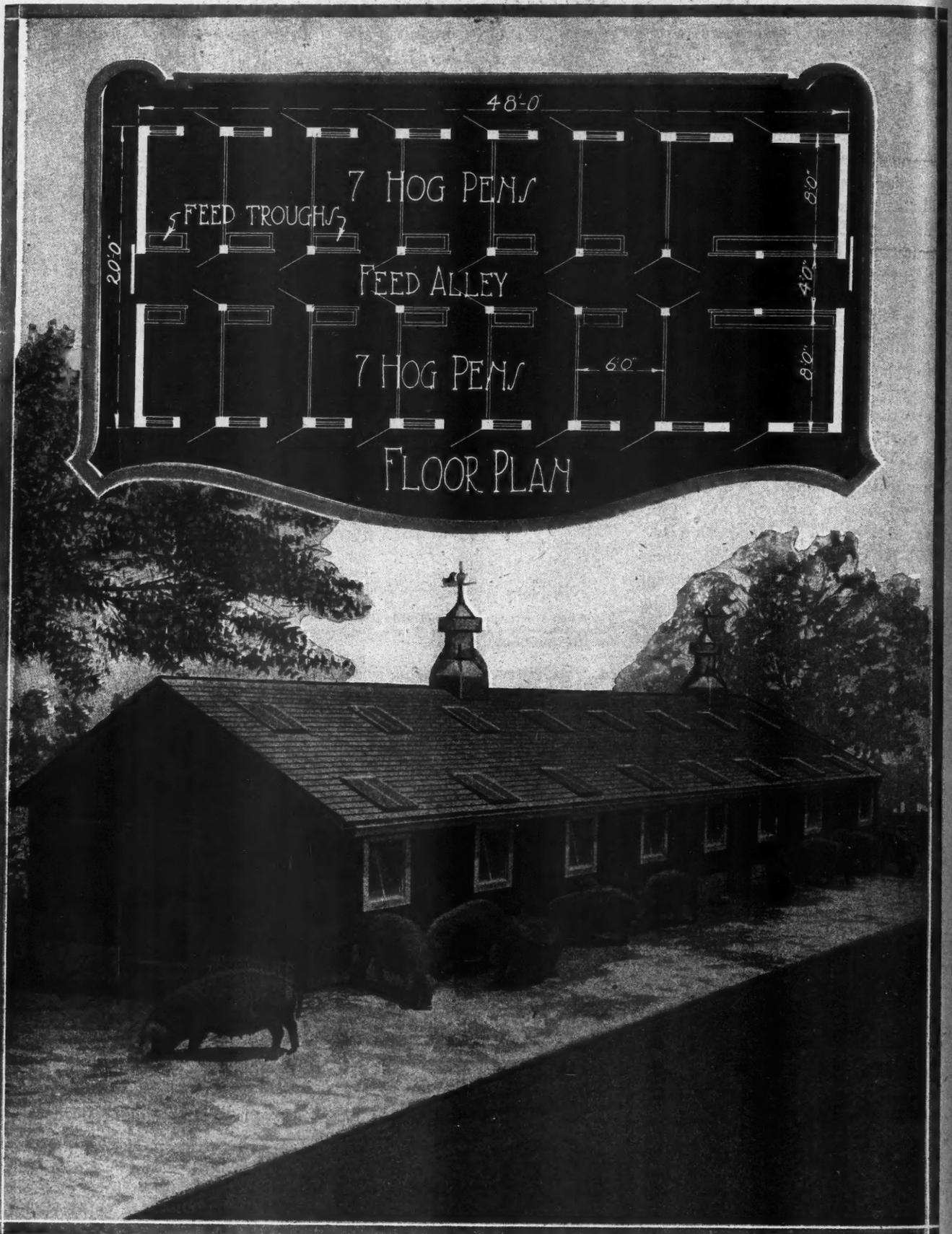
HOG raising has made more clear money for farmers, especially those in the corn belt, than any other enterprise. A few years ago the housing and care of hogs was not of great importance and in many cases they were allowed to shift as best they could. In the last few years, however, enterprising farmers have begun to appreciate the importance of a real home for their hogs and are now asking for the latest equipment. The builder can recommend no better feature than hog-house windows.

The ideal piggery is one that admits sunlight direct to the floor and every nook and corner, especially around farrowing time. Sunlight is the greatest disinfectant in the world and not only makes the hog house warm but sanitary. In the installation of windows it is important to avoid drafts. Therefore the location of hog-house windows is very important. Too much stress cannot be placed upon this point in the construction of the building and it is a point the builder must give careful consideration.

The best way to construct a hog house is east and west so as to have a south front for the skylight sash which are on the roof. The first row of skylights should be placed as near the south as possible, dividing the space between the upper edge of the lower skylights. If your building faces north and south, place two rows of skylights in each the east and west roofs, as shown on the detail page. This arrangement will flood the pens with sunlight during the early months of the year and be a source of energy to the mother sow and her new-born litter. Ventilation in the spring is important.

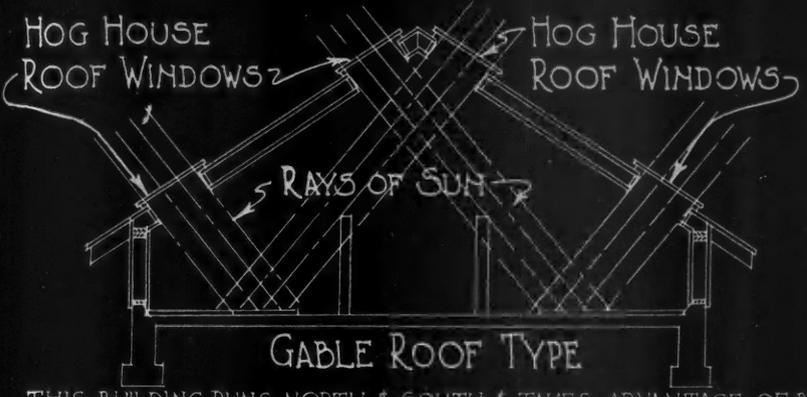
A house running north and south can take advantage of both morning and afternoon sunshine by having roof windows on both sides of the roof.

Hog-house roof windows are manufactured with sheet metal frames and sash by several concerns and vary slightly in size and details. Some are hinged for ventilation while others are of the peak-roof type and have special ventilators installed.



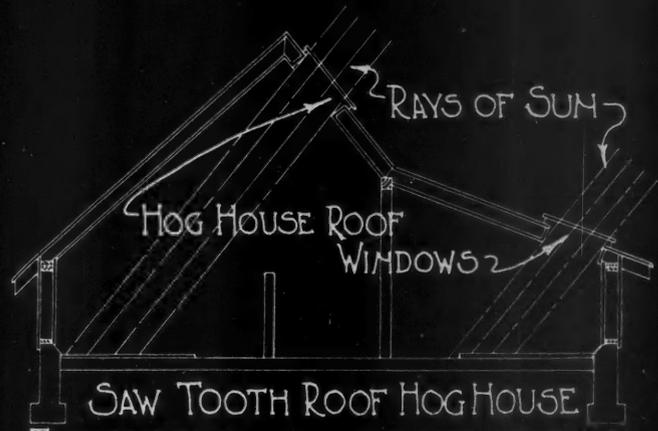
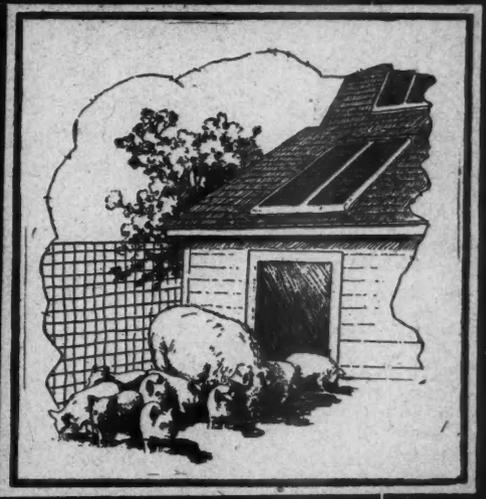
"PUTTING THE PIGS IN A PARLOR." The modern hog house shown here has been equipped with special roof windows that provide plenty of sunshine and ventilation all hours of the day. Successful farmers have found the rays of the sun are the best disinfectant they can use and these windows provide plenty of it to reach all the nooks and corners. Builders who make a specialty of farm buildings incorporate this type of window in their plans just as they include all kinds of modern dairy barn equipment. The well constructed hog house means increased production and healthy hogs—and most important of all, satisfied customers for the builder. This hog house contains fourteen hog pens 8 feet deep, set in two rows on each side of a 4-foot feeding alley. The building is 48 by 20 feet.

RECOMMENDED CONSTRUCTION



GABLE ROOF TYPE

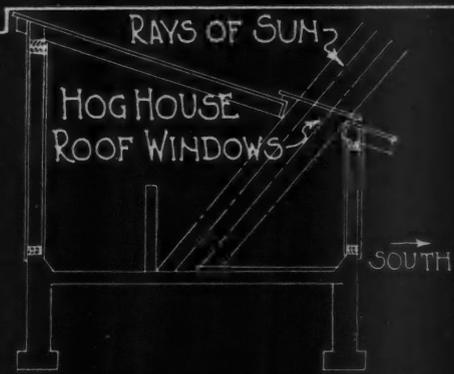
THIS BUILDING RUNS NORTH & SOUTH & TAKES ADVANTAGE OF BOTH MORNING & AFTERNOON SUN. IF BUILDING RUNS EAST & WEST, WINDOWS ON ONE SIDE OF ROOF ARE OMITTED.



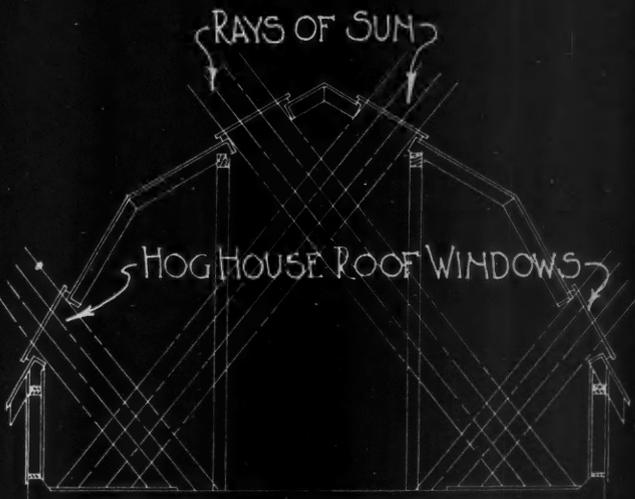
SAW TOOTH ROOF HOG HOUSE

THIS BUILDING RUNS EAST AND WEST TO FACE SOUTH.

HOG HOUSE WINDOWS ARE MANUFACTURED WITH SHEET METAL FRAMES & SASH BY SEVERAL CONCERNS, & VARY SLIGHTLY IN SIZE & DETAILS OF CONSTRUCTION. SOME ARE HINGED FOR VENTILATION.

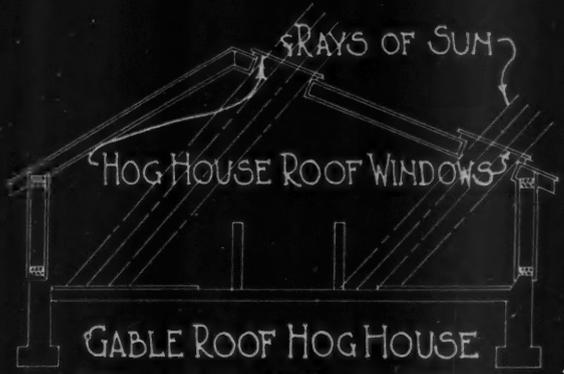


SHED ROOF HOG HOUSE



GAMBREL ROOF HOG HOUSE

THIS BUILDING RUNS NORTH & SOUTH & TAKES ADVANTAGE OF BOTH MORNING & AFTERNOON SUN. IF BUILDING RUNS EAST & WEST, WINDOWS ON ONE SIDE OF ROOF ARE OMITTED.



GABLE ROOF HOG HOUSE WITH GABLE OFF CENTER.

HOG HOUSE WINDOWS ARE ALSO USED FOR SIDE WALLS OF HOG HOUSES, POULTRY HOUSES, ETC., & FOR ROOFS OF POULTRY HOUSES. WINDOWS MAY BE SET SINGLY, OR IN PAIRS.

HOG HOUSE ROOF WINDOWS

Modern Two-Apartment Building

CONTAINS TWO ATTRACTIVE FIVE ROOM AND SUNPARLOR APARTMENTS

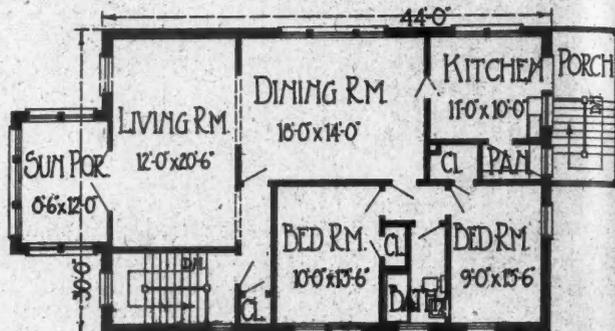
“OWN your own home and somebody else's too,” is the slogan adopted by the sponsors of a large housing project. They propose to build two-story apartments along the lines of the building in the illustration so as to provide the owner with a home of his own and an extra apartment to yield a substantial income. As an investment for the man of moderate means this type of building is unexcelled.

As in all modern apartment buildings regardless of size the feature of this structure is the sun parlor. Distinctly an American innovation in building ideas, it has become one of the outstanding factors in apartment development and has helped as much as many things to increase the rental. In this house the sun parlor has been roofed with attractive green tile. The front is very well designed, the face brick and terra cotta trim making a pleasing combination.

The basement is high, well lighted, a splendid place

for laundry, heating plants, and coal bins, as well as a drying room for clothes.

Each apartment has five rooms, living room, din-



Floor Plan, Showing Arrangement of Apartment.

ing room, two bedrooms and kitchen. The living room is built along the latest lines, being large and roomy with a pair of French doors opening out on the sunparlor. On the opposite side of the living room are two doorways opening into the dining room and hall. The dining room is also comfortable in size, being 18 by 14 feet, with a triple window furnishing plenty of light.

A small efficient kitchen is directly to the rear of it. The day of the large ungainly kitchen has passed, and today contractors and builders are planning small complete kitchens that will prevent much needless work for the housewife.

The two bedrooms are very conveniently located with regard to the other rooms of the apartment. This detail is one often overlooked by the builder in drawing up his plans. These bedrooms have been grouped together with the bathroom away from the noise and activity of the living room where the family is most likely to gather. If any member of the family is indisposed or wants to retire early he can do so without fear of being disturbed by noise.

The building is 30 by 44 feet.



PATERSON, N. J., plans to spend approximately \$1,500,000 in building homes in order to relieve congested conditions. Two hundred new homes will be erected.



Modern Two-Story Apartment Building Containing Two Five-Room Apartments with Sunparlors. A Most Attractive Investment as Well as an Up-to-Date Home. The latest Housing Project Proposes to Build This Type of Structure.

Building Disguised for Civic Beauty's Sake

FIRE BARN SKILLFULLY CAMOUFLAGED TO LOOK LIKE ATTRACTIVE BUNGALOW

THIS building appears at a glance to be a neat bungalow—but it is not. It is built along bungalow lines but is in reality a fire station. One of the beautiful residential districts of Portland, Ore., needed a fire station, but the officials of the city realized that a fire barn

of the usual type would be a neighborhood eyesore and a blot on the beauty of that section. So they hit upon the idea of making a fire engine station house look like a real bungalow.

Many cities have taken up, with pleasing results, this idea of camouflaging necessary but unattractive buildings.



Portland, Ore., Believes in Preserving the Beauty of the City, so They Built a Fire Station and Camouflaged it so That It Looks Like a Neat Attractive Bungalow.

Heating Systems in Garages

TYPES OF GARAGE HEATING PLANTS AND METHOD OF INSTALLATION SHOWN ON BLUEPRINT DETAIL SHEET ON PAGE 97

IN planning a garage today the contractor is asked to provide a heating plant that will be easy and economical to operate and will provide warmth to keep the car in good condition during the cold weather. If the prospective owner should overlook this detail, it is a matter of protection and good business for the builder to suggest the installation of such a heating system.

There are many reasons for heating the garage especially in the northern part of the country where freezing temperatures prevail several months of the year.

Garage heating systems are simple in design and operate either by coal or gas, heating water which in turn carries the heat thru radiators or pipe coils attached to the walls of the building. In this manner the heat is evenly distributed, similar to a hot water heating system in homes.

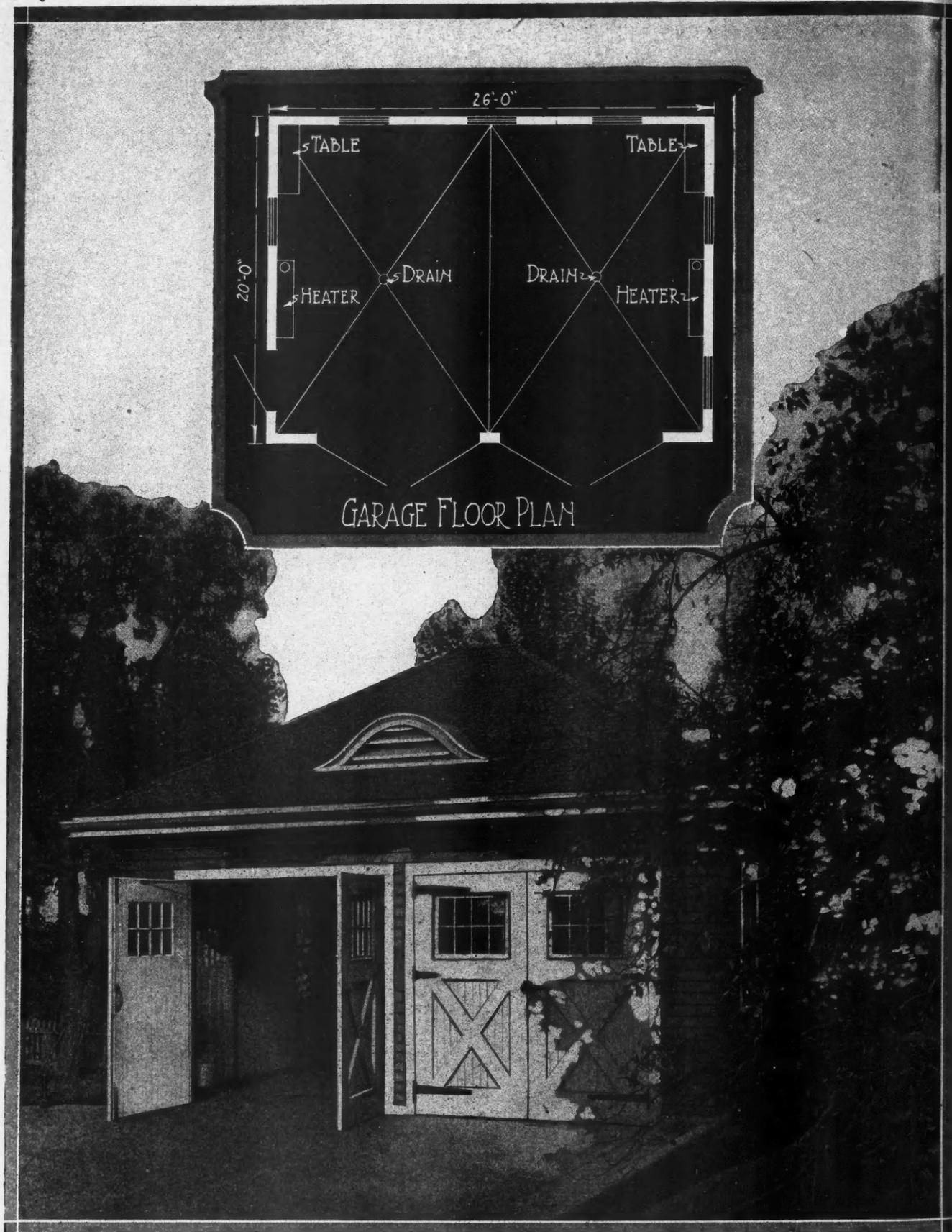
They can be started in the fall and turned off in the spring and maintain the desired temperature without much attention. In one type of gas heater the water passes thru thin coils over the fire and is heated out into the coils or radiators along the wall. All that is

necessary for its continued operation is to add a pint of water once a week. Should the weather change suddenly the automatic control takes care of the changes thermostatically. It is furnished with either natural or artificial gas burners.

The coal burning heater is made for private garages with capacities of one to ten years. It is not connected to any water system, but is filled once at the start of cold weather with a pail or hose. Oil is poured on top of the water in its expansion tank to prevent evaporation.

The installation of garage heaters and the radiator is very simple and any builder can do it with little trouble. If the garage is designed to hold two, three, or more cars a radiator is added for each extra car. The heater for the one-car garage is ample for three cars, that for a four-car garage ample for seven cars and the heater for eight cars will take care of ten.

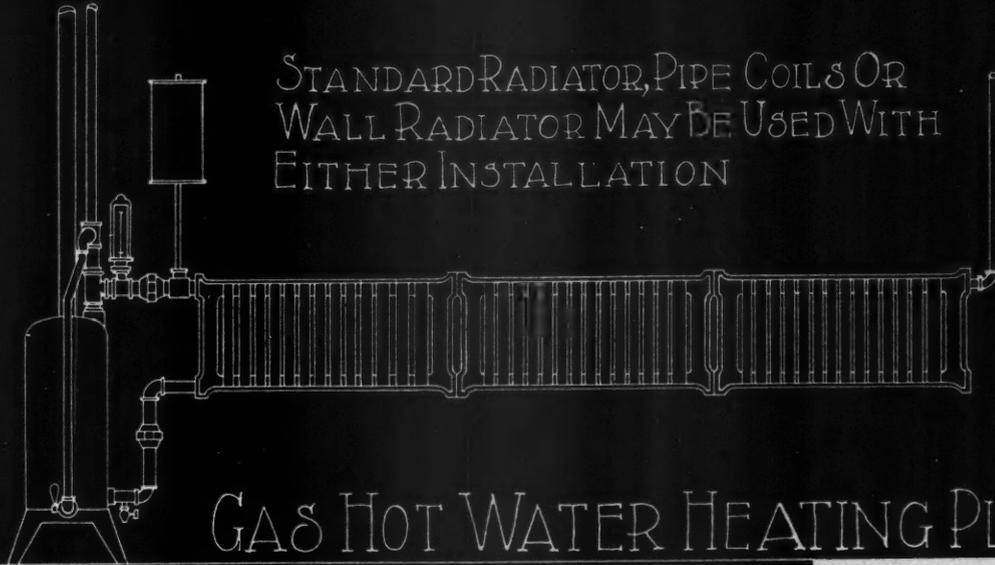
If the garage is two stories, one heater can be arranged to heat both floors as the detail on the blueprint page shows. An extra feed pipe is installed and is connected with a set of radiators above.



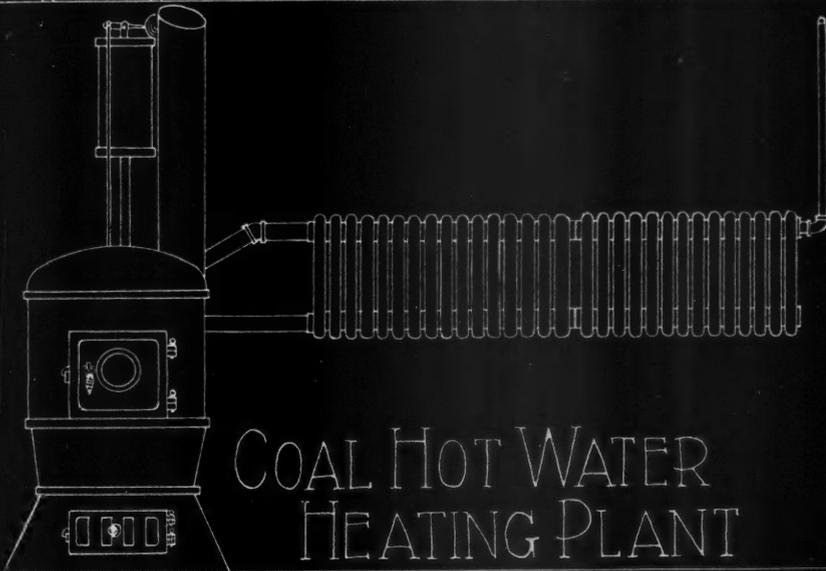
AN EFFICIENT TWO-CAR GARAGE. The builder has erected not only a substantial building, but has made it attractive and a harmonious addition to the general building scheme. Too often garages are put up in slap-stick fashion to the detriment of surrounding buildings. This garage is a real shelter and workshop and is equipped to protect the cars in the cold season with a modern garage heating system, the details of which are shown on the blue-print page opposite. The possibility in door treatment is also shown. The garage is 20 by 26 feet. The floor is concrete with a drain in each compartment.

RECOMMENDED CONSTRUCTION

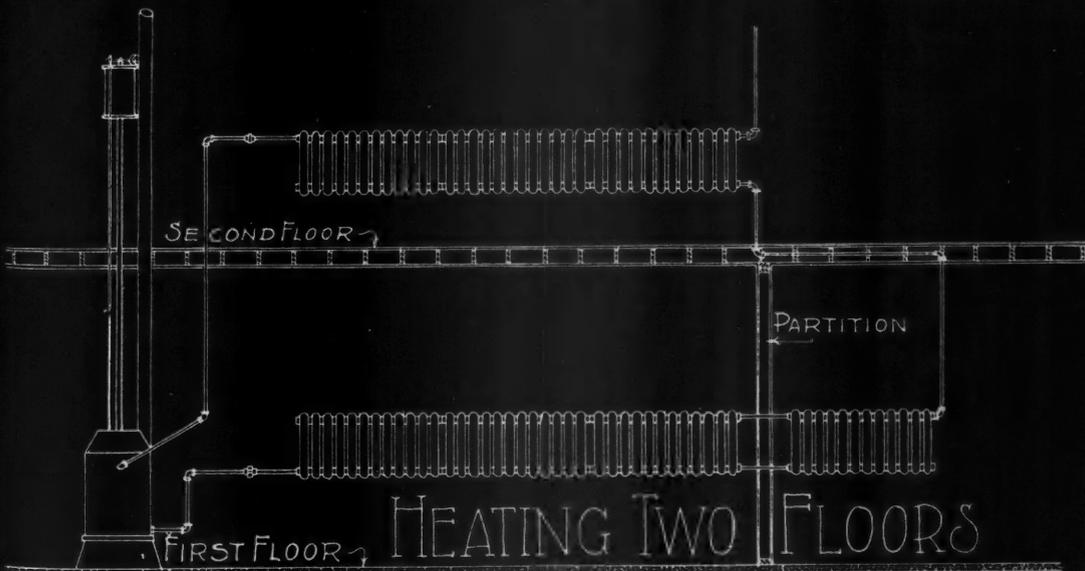
STANDARD RADIATOR, PIPE COILS OR WALL RADIATOR MAY BE USED WITH EITHER INSTALLATION



GAS HOT WATER HEATING PLANT



COAL HOT WATER HEATING PLANT



HEATING TWO FLOORS

GARAGE HEATING



The Sort of Homes the Natives of the Orient Live In.



The Sort of Homes the Foreigners Build in the Orient.

American Home Builders in the Orient

INBORN INSTINCT FOR "HOMES OF THEIR OWN" CAUSES FOREIGNERS TO BUILD IN FAR EAST

By William A. Radford, Jr.

(On a Trip Around the World in the Interests of the American Builder)

SINGAPORE, Straits Settlements, June 17, 1920 —American Builder readers probably have been thinking that I have been lying down on the job, as it has been a couple of months since I sent anything for publication. But the truth is I have had the Indian fever. They have a fancy name for it, but I can't pronounce it, let alone spell it, so will just call it "Indian fever" and let it go at that. Briefly, Indian fever is a combination of malaria, grippe, dysentery, rheumatism, hives and seasickness. Imagine you have

all those at once and you get an idea of what Indian fever is.

However, I am my old self again, and have been seeing and hearing many things that will be of interest to the AMERICAN BUILDER family, and those who are interested in buildings and building equipment. Not the least of these is the fact that way out here, thirty-eight days from the Pacific coast of the good old U. S. A., I have found that the American instinct to have "A Home of My Own" is asserting itself.

Singapore, as you may know, is the chief source of the world's rubber supply. We commonly think of South America, and especially Brazil, as the places of origin of crude rubber. Some idea of how important Singapore is may be gained from the fact that three-fourths of the crude rubber used by American manufacturers is shipped from this port. When you have to change a tire, or have a blowout, it is pretty certain that you are handling rubber that came from the place where this is written.

Because of its importance as a rubber market, Singapore is the home of many Americans, who are interested in that business. When you meet an American in Singapore about the first question he asks is: "When were you in Akron last?" or "Know anyone in Akron?" The rest of the United States does not count for much in Singapore.

These former Akronites are mighty good fellows, as I had reason to find out when the fever overtook me, and, as proof of the old saying that "misfortune brings men closer together," I have become pretty well acquainted with several of them.

A short distance off of Singapore a group of men connected with the Firestone Tire & Rubber Company's branch here are building homes of their own. I was out there the other day. One home is finished—that of Mr. Lepper. Another one, owned by Mr. Cheek, was nearing completion, while the third, which is called the "bachelors' bungalow," was under construction.



William A. Radford, Jr., in the Doorway of One of the Famous Buildings at Delhi, India. Note the Costume Mr. Radford Wears. This Is What Most Foreigners in the Orient Wear, as It Is Comfortable and Convenient.

I secured several photographs, which I think will be of interest to AMERICAN BUILDER readers, as they show some odd construction methods—that is, odd to American contractors and builders.

It will be noted that the Lepper home has a large veranda and balcony overhead. The house contains six rooms, three rooms downstairs and three bedrooms and two bathrooms upstairs. The strangest part of the construction to me was that all the partitions in the house were raised about three inches above the floor to permit a circulation of air. Most of the houses in this part of the world have verandas opening off every downstairs rooms and many of the verandas have balconies overhead.

The scaffolding used here also is unusual, to say the least. It is constructed of bamboo and, instead of ladders or hoists, there is a runway up which the natives carry the materials for the building. The picture of the house under construction is not very clear, but it shows the scaffolding. This

is the home of Mr. Cheek, and will be ready for occupancy before this appears in print.



The Bungalow That American Bachelors in the Rubber Business in Singapore Are Building.

Building in the Orient—that is, every part of the Orient that I have visited, which is considerable—is

going ahead at a great rate. Foreigners who are located here more or less permanently are building good homes, with the conveniences that are common in American homes. But the natives continue to live in their thatched houses.

It has been terribly hot in this country, but

as I am soon leaving for China, I expect to run into weather more conducive to comfort. By the first of August I expect to be either in Shanghai, or on the way there. I will spend several months in China, Japan and on the way home will visit the Philippines.

I forgot to say that I was up to Bangkok, where the king of Siam lives. He was home the days I was there, but they were having the big annual celebration of "the blessing of the plow," and I did not have an opportunity to get an audience.

Nevertheless, I saw him several times and he is a progressive ruler. Rides around in a big automobile, and looks like a regular fellow.



Home of Mr. Lepper, of the Firestone Tire & Rubber Co., Akron, Ohio, Near Singapore, Straits Settlement.



Home of M. A. Cheek, Also of the Firestone Rubber Co., Under Construction Near Singapore. Note the Scaffolding and Runway of Bamboo. The Runway Replaces the Ladders and Hoists Commonly Used in the United States.

DESIGN of SAFE CONSTRUCTION

By Charles W. Leigh

Associate Professor of Mechanics, Armour Institute of Technology

Effect of Loads and Moisture on Strength of Timber

ARTICLE VII OF AN EXTENSIVE SERIES ON STRENGTH OF MATERIALS

IN the preceding articles of this series, the safe working stresses of the materials considered have been based on the supposition that the load was applied quietly. Now it is proven in mechanics that when a load is suddenly applied to a structure, the tensile and compressive stresses set up are twice as great as if the load were applied gradually. Then in designing building, bridges, etc., the engineer must study carefully the types of loads to be carried by the structure before deciding on a safe working stress.

In the first place, he must decide on the dead and live loads. A dead load is usually thought of as the weights of the beams, struts, floor boards and such pieces of furniture and machinery as may be built in with the structure. On a roof truss a snow load is considered a dead load. A live load is one applied suddenly, as a train rushing onto a bridge, a heavy gust of wind against a building, people dancing on a floor, crowds in a grand stand, etc. All such live loads set up violent vibrators, and as stated before, cause strains in the structural members from one to two times as great. It is usually considered that people walking around on a floor will cause stresses one and one-half times as great as a dead load of equal weight. For example, an average fibre stress in short leaf yellow pine is 1,000 pounds per square inch for a dead load. Then for a floor of a church, hall, or school building where dancing is not allowed a safe working stress would be 750 pounds. While if dancing were permitted or heavy machinery were to be moved about the safe fibre stress would be 500 pounds.

The following table gives values for safe working stresses under dead loads for the various kinds of timbers used in construction:

	Pounds per square inch
White Oak	1,200
Southern Long-Leaf or Georgia Yellow Pine..	1,200
Short-Leaf Lellow Pine.....	1,000
Norway Pine	800
Cypress	800
California Spruce	800
Chestnut	800
Douglas Fir	800
California Redwood	750
White Pine	700
Spruce	700
Eastern Fir	700
Hemlock	600

This table of values is based on a factor of safety of 6. That is, if 1,200 is a safe working stress, the breaking stress of the material is $1,200 \times 6 = 7,200$ per square inch.

Another important factor entering into the problem of the strength of a beam is the amount of moisture that it contains. A piece of green wood full of sap will bend and break more easily than one seasoned or dried. Since the fibres of a beam are stronger in tension than in compression, a beam would be expected to fail first on the compression side. This is what happens and is very evident in a wet or green stick. Now, when a piece of timber is dried the fibres are made stiffer and affects the timber more in compression than in tension. That is, the compression side of the timber is more nearly equal in strength to the tension side and the beam will, therefore, carry a greater load.

Now, the values for safe working stresses given in the preceding table are based on a moisture percentage of 18 per cent, as determined from experiment by the U. S. Division of Forestry, in exposed timbers. This department has classified structures as follows:

"Class A includes parts of buildings or structures which are freely exposed to the weather, such as railway trestles, uncovered bridges, etc. The amount of moisture of such timber is taken as 18 per cent.

"Class B includes structural work which is under a roof, but without side shelter, freely exposed to air, but protected from rain, such as roof trusses of open sheds, covered bridges over streams, etc. The moisture percentage is taken as 15 in this case.

"Class C includes timber structural work in buildings which are unheated, but more or less protected from outside air, such as may be found in barns, enclosed sheds, etc. The moisture percentage is taken as 12 in this case.

"Class D includes timber structural work in buildings at all times protected from outside air, heated in winter, such as houses, halls and churches. The moisture percentage is taken as 10 in this case.

Since drying or seasoning a beam increases its strength, such timbers when used in structures of Classes B, C or D could be safely subjected to a larger fibre stress than when used in buildings of Class A.

The following table has been compiled by experiment:

TABLE OF COEFFICIENTS

Classes—	Yellow Pine	All others
Class A.....	1	1
Class B.....	1 1/5	1 1/12
Class C.....	1 3/5	1 1/6
Class D.....	1 1/2	1 1/4

Suppose it has been found that a yellow pine beam used in Class A will carry a load of 5,000 pounds. Then, if this same beam were used in a structure of Class B, it would carry a load $W = 500 \times 1 \frac{1}{5} = 5,833$

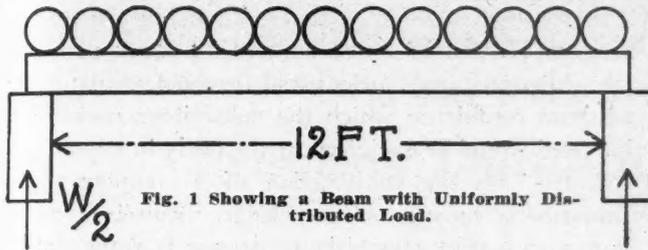


Fig. 1 Showing a Beam with Uniformly Distributed Load.

pounds, or, if in Class C, a load $W = 5,000 \times 1 \frac{3}{5} = 7,000$ pounds, or, if in Class D, a load $W = 5,000 \times 1 \frac{1}{2} = 7,500$ pounds.

Again, if we assumed a safe fibre stress of 1,000 pounds per square inch for yellow pine in a structure of Class A, when used in Class B the working stress would be $p = 1,000 \times 1 \frac{1}{5} = 1,400$ pounds; in Class C, $p = 1,000 \times \frac{1}{2} = 1,500$ pounds per square inch.

The working stresses or the safe loads for other kinds of wood are found by using the corresponding coefficients shown in the table, just as in the above illustration.

As an example, find how large a uniformly distributed load a 6 by 10-inch douglas fir beam 12 feet long will carry, as shown in Fig. 1 when used in a house, Class D. From the formula of the preceding articles:

$$\text{Bending moment} = p \times \frac{b d^2}{6}$$

But bending moment = $\frac{1}{8} WL = \frac{1}{8} W \times 12 \times 12$ inches = 18 W.

$P = 800 \times 1 \frac{1}{4} = 1,000$ pounds, $b = 6$ inches and $d = 10$ inches.

$$\text{Then } 18 W = \frac{1,000 \times 6 \times 10 \times 10}{6}$$

$\therefore W = 5,555$ pounds.

The deflection should now be investigated to see that it does not exceed $\frac{1}{360}$ of the length of the beam in inches.

The formula for deflection with a uniform loading is

$$d = \frac{5 WL^3}{384 E I}$$

Where $W = 5,555$ pounds, $L = 144$ inches, $E = 1,400,000$ and $I = \frac{1}{2} b d^3 =$

$$\frac{6 \times 10 \times 10 \times 10}{12} = 500$$

$$\text{Then } d = \frac{5 \times 5,555 \times 144 \times 144 \times 144}{384 \times 1,400,000 \times 500} = .31 \text{ inch.}$$

The allowable safe deflection is $\frac{1}{360} \times 144 = .4$ inch.

Then the load is safe.

Next test for horizontal shear. From the July number horizontal shear $S_h = \frac{3}{2} J/A$.

But $J = \frac{1}{2} W = 2,778$ pounds and $A = 6 \times 10 = 60$ square inches.

$$\therefore S_h = \frac{3}{2} \times \frac{2,778}{60} = 70 \text{ pounds.}$$

Since the actual size of lumber may be anywhere from 75 to 95 per cent of the nominal size, if the actual deflections and shears are very close to the allowable values, larger sized timbers or smaller loads should be used, since the actual size was used in the computation. But in the above problem the results

were well on the side of safety.

For the convenience of readers who may not have a hand book for reference, a table of the moduli of elasticity for various kinds of timber will be given:

VALUES OF E	Pounds per square inch
Georgia Yellow Pine.....	1,500,000
Short-Leaf Yellow Pine.....	1,250,000
Norway Pine.....	1,400,000
Douglas Fir, Dense Grade.....	1,400,000
Douglas Fir, Sound Grade.....	1,200,000
Hemlock, Western	1,400,000
Oak	1,300,000
Eastern White Pine.....	1,300,000
Spruce	1,000,000
Tamarack	1,200,000

PORTLAND cement production for 1919 was 80,000,000 barrels (correct figures) compared with 74,000,000 barrels the previous year. Shipments were 85,000,000 barrels (correct figures) compared with 72,000,000 barrels the previous year. The average price of cement during 1919 was \$1.69 per barrel, an increase of 6 per cent over 1918. Exports during 1919 were 2,464,000 barrels, an increase over any previous year, except 1915 and 1916.

Women and the Home

(Continued from page 74.)

ant rooms, bright interiors, good taste in decorative homes, sanitary and healthful bathrooms and bedrooms, all these are dependent on the good judgment and selection of the housewife.

Seated on her household throne, she rules over her domestic kingdom with gracious sweetness and charming dignity, guiding the family ship of state thru dangerous channels with unerring judgment, breathing forth a cheerfulness that permeates all who come in contact with her, and persevering with a gentle persistency and imperturbable optimism that "defieth all understanding."

Law for the Builder

THE ASSIGNABILITY OF BUILDING CONTRACTS

By Leslie Childs

WHETHER or not a building contract can be assigned, where no reference to its assignability appears in the instrument itself, is often a close question. Much depends upon the nature of the contract, and whether or not confidence, in the personal skill or experience of the contractor, was a determining factor in the entering into of the agreement. A clear case on the point arose in Wisconsin a few years ago, that illustrates the general rule adopted by the great majority of the courts of the United States.

In this Wisconsin case, subscription papers were circulated for the purpose of obtaining \$14,000 with which to build a canning factory. By the terms of these subscriptions, the Industrial Construction Co. agreed with the subscribers to erect a factory for the above named amount. The work was to be done according to specifications attached, and was to be started when the \$14,000 had been subscribed.

The money was subscribed, and two days after this event, the Industrial Construction Co., without the consent of the subscribers, assigned the contract to three individuals, Rasmus Johnson, Christ Johnson, and T. H. Pardoe. Immediately thereafter these gentlemen began work on the contract and completed it, according to the terms and specifications, so they claimed. But when they attempted to collect on the subscription, some of the subscribers refused to pay, on the grounds, among other things, that the contract was with the Industrial Construction Co., and not with the Johnsons and Pardoe. Claiming that the Industrial Construction Co. had no right to assign the contract without the consent of the subscribers.

Thereafter the Johnsons and Pardoe brought suit against one of the subscribers in an attempt to force payment. The case finally reached the Supreme Court, and in passing on the assignability of the contract in question it was said:

"It is established that the Industrial Construction Co. attempted to make an absolute assignment of its contract two days after its execution, and before any work was done thereunder. * * * This contract

obligated the Industrial Construction Co. to build and equip a canning factory according to specifications attached to the contract that seem to be complete as to details. The assignees [the Johnsons and Pardoe] were wholly inexperienced in constructing plants of this character, while the assignor [Industrial Construction Co.] apparently followed the business of so doing. This contract manifestly imposed a liability upon the assignor [Industrial Construction Co.] of the plaintiffs [the Johnsons and Pardoe] and involved a relation of personal confidence which the subscribers must have intended would be exercised by the party in whom they confided. In the construction of a complex plant, subscribers, having no knowledge themselves as to how such a plant should be constructed, would naturally



"When They Attempted to Collect on the Subscription, the Subscribers Refuse to Pay on the Grounds That the Contract Was with the Industrial Construction Co."

prefer to make their contract with a party having the requisite knowledge and experience rather than with persons having neither. Good business judgment would dictate that such a course should be pursued. They had the right to select the party with whom they would deal, and, when the selection

was made and the contract was executed, there could be no substitution of contractors in the case before us without the assent of the subscribers." (Johnson vs. Vickers, 120 N.W. 837. 21 L.R.A. N.S. 359.)

The court thereupon ruled that the assignees, the Johnsons and Pardoe, could not force payment for the work done from the subscribers. Holding that the contract was not assignable, without the assent of the subscribers.

The ruling in this case is in accord with the weight of authority in many states, which hold broadly that a building contract is not assignable if it has been entered into because of trust or confidence in the personal skill, experience, or knowledge of one of the parties. And whether a given contract falls within this class or not, depends upon all the circumstances surrounding the making of the agreement.

It is worthy of note, however, that this general rule as to the nonassignability of contracts, where the element of skill is involved, does not have as strict an application where it is of a public nature.



Amplly Protected from Lightning. St. John's Tuberculosis Sanitarium, Springfield, Ill., Has Been Rodded to Take Care of Lightning in Storms. \$8,000,000 Is Lost Yearly from This Cause.

Erecting Lightning-Proof Buildings

CONTRACTORS ARE SPECIFYING LIGHTNING PROTECTION ESPECIALLY IN ALL KINDS OF FARM BUILDINGS.

EIGHT MILLION DOLLARS is the annual toll of lightning in the United States. Thirty-seven out of every 7,000 buildings not protected were struck last year. In a recent report the United States Department of Agriculture says: "It has been found that properly installed rods reduce the probability of a barn being destroyed by lightning by about 99 per cent.

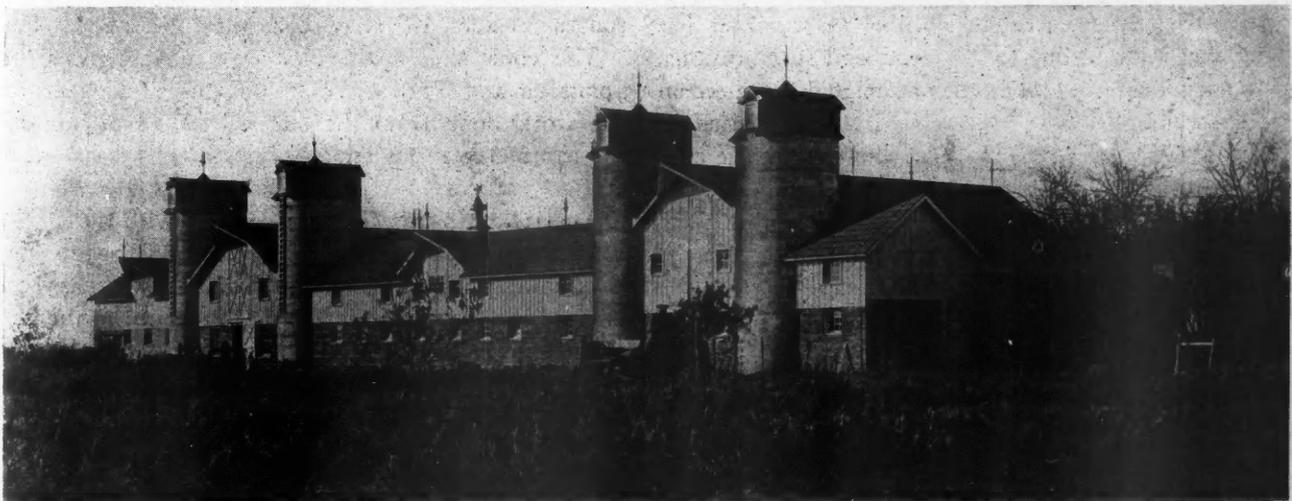
These facts should be as important to builders as to the property owners themselves because the responsibility of specifying and installing lightning protection rests with them. Many contractors make a specialty of farm buildings. Large barns are the crux of the modern farm. Upon it the farmer rests his hopes. It holds his potential income, the crop and animals which will determine whether or not he can continue in business. Yet in a few hours this building may become a mass of ruins, a monument of his hopes.

A little foresight and careful study of the building problem with relation to nature's elements on the part of the man who built that barn would have prevented the disaster.

Buildings are constructed to withstand the wind and weather. Stout walls and durable material provide the buffer against these elements and enable the home, farm or other buildings to stand up for years; but in many cases the element of lightning, the thief in the night, is entirely overlooked by the contractor and the owner who generally relies upon the former's suggestions and advice.

A little information of the character of lightning should prove interesting. Lightning is a discharge of electricity thru the air which encountering the resistance of the air, a very poor conductor, makes it white hot. This produces the effect we see in the sky. Unless resisted in its course lightning will not make a fire or cause a disturbance. Wood offers much resistance and as a result is often shattered. Metal is a very good conductor and is immune. Herein lies the basic principle of the lightning rod. When it strikes the rod it is immediately carried to the ground without causing any damage or disturbance. Imperfect conductors of electricity such as dwellings, barns, schools, churches, (not much metal has been used in construc-

(Continued to page 118)



Farm Barns Are Easy Prey of Lightning Unless Well Protected by an Adequate System of Lightning Rods. The Owner of This Large and Modern Dairy Barn at Riverton, Ill., Is Not Taking Any Chances.



Bird's-Eye View of Buildings Under Construction in Fairfield, Iowa. Twenty-Four Houses Have Been Completed and More Are Being Started in This Town of 7,000 People.

Employers Finance Home Building Project

FIVE MANUFACTURERS IN FAIRFIELD, IOWA, FORM BUILDING COMPANY AND ERECT 25 HOMES

By Ivan Mattson

HOUSING is perhaps our most acute problem at the present. Not only are our big cities suffering for lack of dwellings, but even small towns are in equally desperate straits. The big home building projects have, of course, commanded the most attention, but the small city will find unsuspected advantages in organized home building.

Such has been the experience of Fairfield, Iowa, a county seat town of about 7,000 population, with seven factories, a wholesale paint and glass house, and a brick and tile works. Last year these industries began to realize that the lack of housing was holding back their expansion even more than slow railroad service or scarcity of raw materials.

The business men organized the Fairfield Building Company early this spring with a capitalization of \$200,000, \$100,000 of which has already been paid in; the balance to be raised in installments as needed to finance the purchase of additional equipment. The first \$100,000. was paid in five "calls" of \$20,000. each.

The following is a list of the largest stockholders: The Loudon Machinery Company; The Iowa Malleable Iron Company; The Dexter Washing Machine Company; The Fairfield Glove & Mitten Company;

Thoma & Son, Inc. The officers are: R. B. Loudon, president The Loudon Machinery Company, president; Fred L. Lunt, manager The Fairfield Glove & Mitten Company, vice-president; Wm. L. Long, secretary; W. H. Bangs, vice-president and manager First National Bank, treasurer.

An old flour mill that had been idle for several years—a "white elephant" to the owner—was bought by the Building Company at a bargain to be transformed into a planing mill. As soon as deliveries could be made, the planing mill received the following equipment: band saws, jointers, planers, stickers, clamps, tenoners, boring machines, shapers, grinders, swing saws and accommodation rip-and-cutout saws.

Mr. Edward Angstead, the manager, buys mill run lumber in carload lots. This lumber is sorted upon arrival and every bit of millwork produced in the mill. The mill has not been in operation long enough yet to have any definite figures available as to the saving brought about, but it is evident that these savings will be great enough to enable the mill to show a very satisfactory return on the investment.

The news that there is a home building project on here, attracted plenty of labor to keep things moving on schedule. This last spring was very wet; as a



Three Types of Homes Which Are Part of the Fairfield Housing Project Financed by the Leading Manufacturers of That City. Lack of Housing Has Been Holding Back Their Expansion.

result the sewer, cellar, and masonry work fell far behind schedule, but all the carpenters were kept busy. Repair jobs at some of the factories, and out over the town gave them employment until the foundations were ready.

The first building site was an eleven acre tract, very conveniently located, but the topography was such that no real estate dealer had ventured to sub-divide it. The Building Company secured this tract for about two-thirds of what a more level piece of ground similarly situated would have commanded. By

building a whole group of houses as a single job, and putting full basements under all of them, the dirt moving was so handled that this sub-division will be very attractive, and well drained, whereas, on more level ground, there would have been an expensive job of carting away the surplus dirt. The big thing, however, to be emphasized in this connection is that this particular piece of ground would never have made an attractive homesite with each property owner following his own notions. City planning is automatic where a real home building company holds sway.

In most of the home building projects we have seen discussed, there has usually been some one design used thruout. We have striven to get away from the sameness in *appearance*. This has been achieved by standardizing *unit parts* of construction. For instance, four standardized roof shapes have been used on these cottages over identical floor plans. These roofs have been covered with two different colors of prepared shingles, and cedar shingles. These are further varied by the use of eight different styles of porches. Walls are painted in seven different colors. Foundations are in brick, concrete blocks, and stuccoed tile. Walls are made with wide drop siding, alternate wide and narrow drop siding, and with shingles.

Bathrooms, plumbing and arrangement are standardized. So also are doors, windows and furnaces. This kind of standardization makes real savings, but does not offend. A number of people have wanted



More Units in the Housing Plan. Four Roof Shapes Have Been Used and Each House Is Varied in Style to Prevent Sameness in Appearance. Eight Styles of Porches Were Used.

to contract for houses, but the building company in its main building project is not ready for this kind of work. If homes shall be within the reach of most of us, we shall have to buy the finished article just as we buy our automobiles and breakfast foods. A home building company, amply financed, and competently managed, can operate on a manufacturing basis where a number of small contractors couldn't remain in business unless they catered to the owners-to-be.

Now a word about financing. The building company aims at as rapid a turnover as possible. The building proceeds on schedule, but not until the house is finished is it for sale. If the buyer needs terms, the local Building and Loan Association will lend two-thirds of the selling price, which together with a minimum of 12½% cash is paid over to The Building Company. The balance of 20% is carried back on a second mortgage by the Building Company at the local current rate of interest. The indebtedness to the Building Company is paid off in monthly installments over the same length of time as the Building & Loan. From this it will be seen that finance and operation are separated, and the financing is practically done out of the savings of the local people. In this connection, it is interesting to note that all of Fairfield's industries have been developed out of the savings of the business—no outside capital has been brought in. And so what could be more natural than to finance the Home Building locally?



Nearing Completion. This New Section Has Been Built by Progressive Employers of Labor Who Recognize the Importance of Housing with Regard to Labor Turnover. The Organization Was Formed with a Capital of \$200,000 Subscribed by Seven Concerns.



Fred Beard says

“Kitchens Should Be Planned to Accommodate Modern Labor-saving Equipment”

FRED BEARD had the big show window of his hardware store filled with home equipment that would appeal to the June brides. He had just finished the job and was contemplating with satisfaction the manner in which he had arranged the equipment required to make the modern kitchen a delightful “woman’s workshop,” a place where the work could be done easily and satisfactorily.

Occupying a place of honor in the display was a kitchen cabinet—the sort that every good housekeeper wants, and that thousands are buying every year. Contracted into the small space the cabinet occupied were compartments for the staple ingredients that cooks constantly use, closets for mixing dishes and a metal covered work board. Below were drawers and compartments for the cooking utensils. Fred Beard had arranged the cabinet so that all of these features could be seen plainly.

“Up to your old tricks, I see, Fred,” remarked a voice at Beard’s elbow. “Showing the women all the things they can have in their homes to make house-keeping what it ought to be.”

“Yes,” responded the hardware dealer, turning to greet his friend Sam Williams, the building contractor. “Yes, I am trying to show the women of this town what they’re missing if they don’t put labor-saving equipment in their homes, especially in the kitchens. Women, you know, Sam, spend many hours of their lives in the kitchen. They would spend fewer hours and be less tired if they would put in some of these conveniences. Take that kitchen cabinet there, that alone will save many miles of walking about the kitchen during a year.”

“Speaking of Kitchen Cabinets—”

“Speaking of kitchen cabinets—did Harry Michaels come in and buy a cabinet today? You know that new home that I am building for him is about finished, and only today he was asking my advice about the kitchen furnishings. I planned the kitchen in his home for all the modern kitchen equipment and have exactly the right amount of wall space, properly located to accommodate a kitchen cabinet. He thought my suggestion about the cabinet a good one, and I sent him down to you. Did he buy?”

“He was in looking at the cabinets, but hasn’t

bought one yet. He wants to bring Mrs. Michaels in to look at it. Which is perfectly right, too. Women are the ones who are going to use the kitchen cabinets and they are the ones who ought to be consulted. I’ll make that sale. Much obliged for recommending my store and helping me sell the cabinet, Sam.”

“Oh, that’s all right. Glad to have done it. You know our motto, Fred—help the home builders all we can to equip their homes so that they will be comfortable, convenient and satisfactory in every way. That old saying about ‘a satisfied customer is the best sort of an advertisement’ holds as good when you are in the building business as when you are selling hats, shoes or clothes.”

Fred Beard Gets An Idea About Selling Kitchen Cabinets

Fred Beard appeared to be listening to the contractor’s talk, but after Williams had ceased speaking he did not resume the conversation at once. When he did he was back on the subject of kitchen cabinets.

“Sam, your recommendation of a kitchen cabinet to Michaels gives me an idea—one that will mean more sales. There is no reason why we shouldn’t work together in the sale of kitchen cabinets. That’s all very well about helping your clients get good homes—homes that are well equipped and ‘comfortable, convenient and satisfactory,’ as you express it. But your sending Michaels here to buy a cabinet means profits to me. When two men are in similar lines of business and can help each other do more business, they have many opportunities to co-operate to the advantage of both.

“That’s what I meant when I said your action today gave me an idea. I am going to take you into partnership with me in the business of selling kitchen cabinets—that is, I am going to make you a special kitchen cabinet salesman for me. You know there is a good-sized profit on the sale of a kitchen cabinet; has to be—I don’t sell one every day, and in a great many instances the sale price is split up into installments. Still kitchen cabinets are about the most profitable line I handle. Now suppose you help me sell cabinets. I not only make a good profit on every one of them, but I sell more of them and move them more quickly with your help. You won’t lose anything by your co-operation.”

"I wasn't boosting for you with an expectation of getting a split," said Williams. "Some time ago I got that idea about planning kitchens so that there will be just enough room to accommodate the furnishings and fixtures that are necessary. It came to me when I was trying to figure out ways of cutting the cost of home building. I figured on several jobs that I didn't get because the houses cost too much. So I decided that if I could save a few dollars here, and some more in other places, I could land more work.

"The kitchen is, as you say, the most important room in the house, from the woman's standpoint. It ought to be large enough for all purposes, and still not so large that the work cannot be done efficiently. The old-fashioned way of building a big, square room and then putting in the fixtures does not coincide with present-day methods of doing things. Build the kitchen of the right size and shape to accommodate what you are going to put in it, rather than make the furnishing suit the room.

"Take that kitchen cabinet, for instance. The cabinet ought to be located adjacent to the sink. It ought to have a window on either side of it. The stove ought to be as near the cabinet as possible. It's an easy matter to plan and build a kitchen that has just the right amount of wall space, properly located to accommodate the kitchen equipment. And the big point is that when a kitchen is planned and built with that idea in mind, it doesn't have to be a large kitchen—in fact, after you have made the plans it is surprising how small the room is.

"You know something about building, Fred, and you can realize how much material and labor can be saved when you build a kitchen along modern lines. When materials and labor were cheap perhaps it was all right to have a big pantry adjoining the kitchen and a lot of built-in shelves and closets scattered around the walls. They did not cost half as much as they do now, also they gave the kitchen worker plenty of exercise walking from one to another. I do not put built-in cases in the kitchens I plan now. As I said, I plan them to accommodate the right kind of equipment and furnishings, and even tho a kitchen cabinet is not put in when the house is built, the owner will soon get one, as he will have no old, clumsy wall cases to tear out—wall cases that he has paid good money for and is loath to throw on the kindling pile."

"You've got the right idea, Sam. Keep on planning kitchens to accommodate the furnishings. You will save every one of your clients more than enough to buy a kitchen cabinet, and, besides, will give all of them more convenient homes."

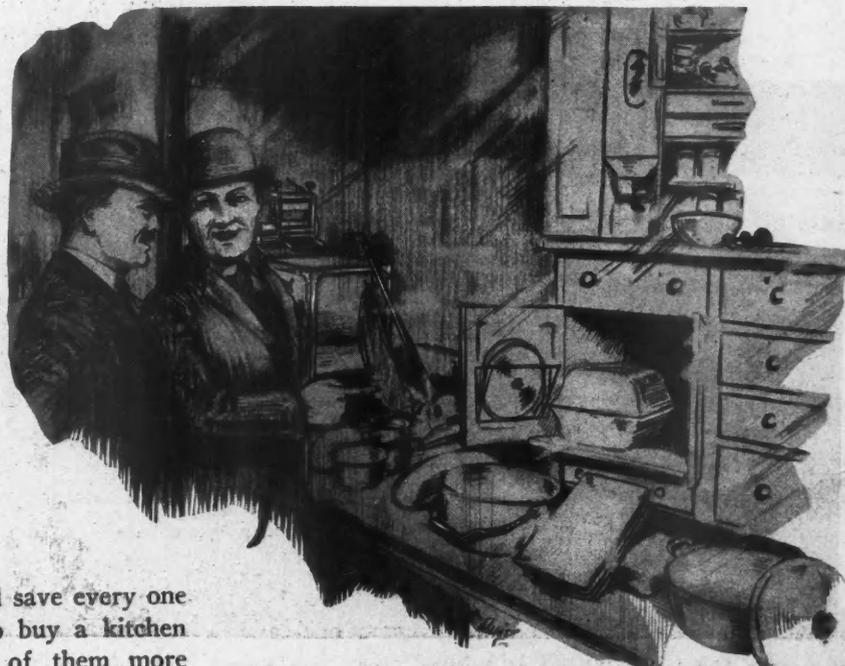
Method of Measuring Hydrated Lime

A CUBIC foot of hydrated lime weighs approximately 40 pounds. On this basis the amount of hydrate to be used per bag of cement can be quickly computed in terms of a cubic foot. This result, multiplied by 2 or 3 (according to the number of bags of cement to be used per batch), gives the total volume of hydrated lime in cubic inches that will be required per batch of concrete. A box can then be made to hold the required amount of hydrated lime per batch. Standard size pails may also be used to measure the exact amount of hydrated lime required per batch.

As an example, suppose 8 pounds of hydrated lime (ordinarily specified as 8 per cent of the cement) is to be used per bag of cement in a 1-2-4 mixture, and the contractor finds it convenient to mix three-bag batches. Eight pounds of hydrate is equivalent to 1/5 cubic foot. This, multiplied by 3 (number of bags of cement in a batch), gives 3/5 cubic foot (1,037 cubic inches) of hydrated lime per batch, or a box 10 by 10 by 10 inches (inside dimensions) will be sufficiently close. It is also well to remember that the following mentioned pails, when full, hold the approximate quantities of hydrated lime shown.

- 4-quart pail holds 5 pounds.
- 6-quart pail holds 7½ pounds.
- 8-quart pail holds 10 pounds.
- 10-quart pail holds 12½ pounds.
- 12-quart pail holds 15 pounds.
- 16-quart pail holds 20 pounds.
- 20-quart pail holds 25 pounds.

DON'T attempt to board a moving car. There is no business important enough to be crippled for it.



"Showing the Women All the Things They Can Have in Their Homes, to Make Housekeeping What It Ought to Be"

CORRESPONDENCE

Questions answered—ideas exchanged

You Are Requested and Urged to Make Free Use of These Columns for the Discussion of All Questions of Interest to the Building Industry

Framing Name in Shingle Roof

To the Editor: Uhrichsville, Ohio.

I am building a barn for a client here who, in getting his asphalt shingles for roof, had to take a few red and the balance green.

I wonder if these could be possibly worked in as a name similar to the treatment of slate on buildings?

If this can be done I would like to do it. The name I would like to work in is F. W. ANDREGG, A. D. 1920.

Can you suggest a style of letter to use in this work?

CARL E. JONES.

10	75	150	225	300	375	450
11	150	300	450	600	750	900
30	225	450	675	900	1,125	1,350
40	300	600	900	1,200	1,500	1,800
50	375	750	1,125	1,500	1,875	2,250
60	450	900	1,350	1,800	2,250	2,700
70	525	1,050	1,575	2,100	2,625	3,150
80	600	1,200	1,800	2,400	3,000	3,600
90	675	1,350	2,025	2,700	3,375	4,050
100	750	1,500	2,250	3,000	3,750	4,500
200	1,500	3,000	4,500	6,000	7,500	9,000
300	2,250	4,500	6,750	9,000	11,250	13,500
400	3,000	6,000	9,000	12,000	15,000	18,000
500	3,750	7,500	11,250	15,000	18,750	22,500
600	4,500	9,000	13,500	18,000	22,500	27,000
700	5,250	10,500	15,750	21,000	26,250	31,500
800	6,000	12,000	18,000	24,000	30,000	36,000
900	6,750	13,500	20,250	27,000	33,750	40,500
1,000	7,500	15,000	22,500	30,000	37,500	45,000

It is estimated that a good bricklayer can lay about 1,500 brick in eight hours.—THE EDITOR.

Problem in Brick Laying

To the Editor: Stewart, Ohio.

What I want to know is how to figure brick work by the sq. ft.; how many 4 by 8 by 2 1/4 brick to a sq. ft.; how many can a man figure for an 8-hour day?

GEO. C. BOLES.

Answer—The table shown here gives the number of common bricks required for walls of different thicknesses:

Surface Area of Wall (Sq. Ft.)	Number of Bricks Needed for Thickness of—					
	4 Inches	8 Inches	12 Inches	16 Inches	20 Inches	24 Inches
1	7	15	23	30	38	45
2	15	30	45	60	75	90
3	23	45	68	90	113	135
4	30	60	90	120	150	180
5	38	75	113	150	188	225
6	45	90	135	180	225	270
7	53	105	158	210	263	315
8	60	120	180	240	300	360
9	68	135	203	270	338	405

Mortar for Glazed Brick

To the Editor: Tripoli, Ia.

Please tell me how to make a good mortar for laying white glazed brick at inside of creamery, and making small and sanitary mortar joint.

I. RESHOLZ.

Attractive Group of Farm Buildings

To the Editor: Hickman Mills, Mo.

I am sending you under separate cover, photographs of buildings on the Heart of America Farm, situated ten miles



Panoramic View of the "Heart of America Farm" Near Kansas City, Mo., Owned by C. H. Walker, Breeder of Poland China Hogs. It Was Built by Richard Weston, Contractor, Hickman Mills, Mo.

PRESENTING

A New Catalog



When purchasing your hardware look for this mark. It means dependable hardware made for permanence.

BALL BEARING BUTTS

Illustrating the various styles of Ball Bearing Butts made by The Stanley Works.

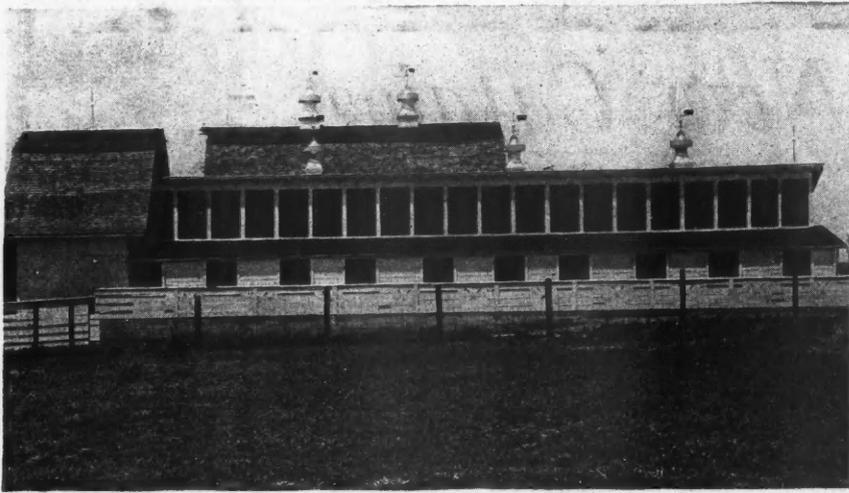
If you are "Building for Permanence" you will want one of these books. Write for A-7.

THE STANLEY WORKS

NEW YORK

NEW BRITAIN, CONN.

CHICAGO



Model Hog House on Walker Farm Where Prize Poland China Hogs Are Raised. It Contains the Latest Features in Hog House Construction.

southeast of Kansas City, owned by C. H. Walker, publisher of the Poland China Journal of Kansas City, and breeder of the big type Poland China hogs. This farm is equipped espe-

C. H. & E. portable saw rig which I find is a great labor saver.

Business was rushing here last year. I worked a crew of ten men practically all summer and prospects for the coming season look favorable.

HAROLD HANSEN,
General Contractor.



Can You Help Him Out?

To the Editor: Flint, Mich.

Kindly inform me if there is any machine made that will feed the nails to the lather so he don't have to have the nails in his mouth.

If there is any machine that is successful this way, kindly give me the name of the manufacturers. JAMES E. LUND.



Points Out Errors in Problems

To the Editor: Pottstown, Pa.

The following errors came to my attention in recent numbers of the AMERICAN BUILDER and I am offering corrections for same.

1. In the March number, on page 160, Correspondence Department, in my article on "Computing Chord Lengths" there is an error in the second line of the exact formula. As printed it reads:

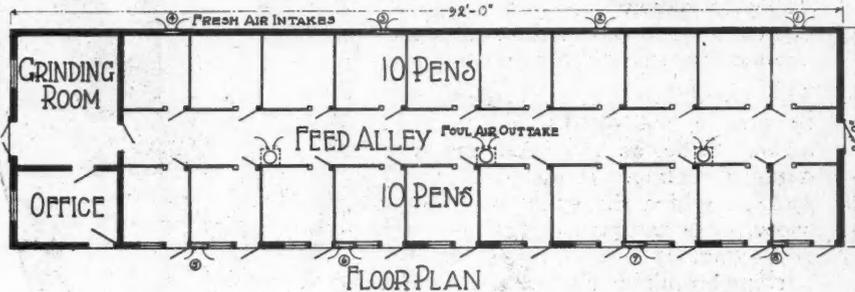
$B = R \cos A = \sqrt{R^2 - \frac{C^2}{4}}$. The last term is incorrect, there being a minus sign between R^2 and $\frac{C^2}{4}$ omitted. The line should read correctly thus:

$$B = R \cos A = \sqrt{R^2 - \frac{C^2}{4}}$$

2. Also in the June number, page 140, Correspondence Department, Mr. Wesselmann, in answering Mr. Frike's and Mr. Cole's problems, states in the next to the last paragraph that

the CHORD of the segment = $\frac{72}{360} \times 3.1416 \times 40 = 25.1328$ inches. This is correct for the arc of the segment and the word "ARC" should be used in the place of "CHORD." The chord was found to equal 23.50 inches.

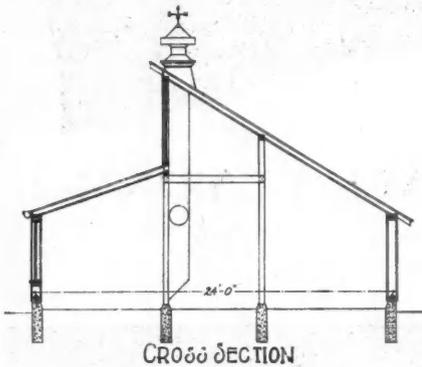
WESLEY H. BLANK, C. E.



Floor Plan of Hog House Showing Number and Arrangement of Pens and Feed Alley.

cially for such purposes.

I am much pleased with the BUILDER, and file everyone, for I use them (even tho they be three or four years old)



Cross-Section of Same Building.

for plans and instructions for which they are valuable to me.

RICHARD WESTON,
Contractor.



American Builder Helps In Barn Building

Dear Sir: Tower City, N. Dak.
Enclosed a snap shot of barn typical of the style in this community. This barn is constructed on the Kaupman farm near Tower City.

The AMERICAN BUILDER was very educational to me for this way of construction three years ago, when I built the first one. Since then, I have built quite a number of them, and would rather build them than gambrel roof. I have a



Mr. Harold Hansen, Contractor, in Tower City, N. Dak., Writes This Is Typical of the Barns Being Built in That Community. He Got His First Ideas on Barn Construction from the American Builder.

What Asbestos is:—Durable*

Roofing as durable as a stone wall

UNCHANGED through countless centuries of heat and pressure, Asbestos remains today the survivor of destructive forces whose intensity is beyond the limits of our imagination.

The durability of this strange, fibrous mineral is one of the qualities which makes Asbestos the ideal material for modern roofing. It makes a roofing of rock on which the sun's hot rays, rain, snow, ice or dampness have hardly more effect than on a stone wall. Sparks or burning brands cannot ignite it—Asbestos Roofing is permanent—the once-and-for-all roofing.

And Johns-Manville, as roofing specialists, producing nearly every kind of roofing—have developed a complete line of Asbestos Roofings.

There are Johns-Manville Built-Up Roofings for flat roofs, various grades of Johns-Manville Asbestos Ready Roll Roofings for sloping roofs, Johns-Manville Standard and Colorblende Asbestos Shingles, and Johns-Manville Corrugated Asbestos Roofing and siding for skeleton frame buildings.

Johns-Manville Asbestos Roofings are sold through distributors all over the country.

Johns-Manville Asbestos Roofings are approved by the Underwriters' Laboratories, Inc.

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 10 Factories—Branches in 63 Large Cities
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and its allied products

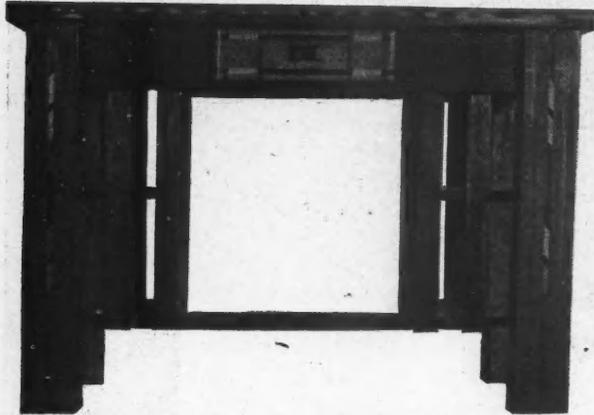
JOHNS-MANVILLE Serves in Conservation

Heat Insulations, High Temperature Cements, Asbestos Roofings, Packings, Brake Linings, Fire Prevention Products

JOHNS-MANVILLE ASBESTOS ROOFING

Builds Beautiful Inlaid Table

To the Editor: Plymouth, Iowa.
 I am sending photographs of an inlaid library table which I have built. This library table has 788 separate pieces. The top alone has 473.
 Eight different kinds of wood were used; red gum, white



Inlaid Library Table Built by M. F. Gage, Carpenter, of Plymouth, Iowa. It Contains 788 Separate Pieces and Took Six Months to Build.

maple, black walnut, red oak, beech, Tennessee red cedar, black ash and ebony.
 No two pieces of the same kind of wood touch each other in the inlay work. The top of the table is 22¼ by 43¼ inches and height is 31 inches. I was six months making it.

M. F. GAGE.

Lumpy Cement is Useless

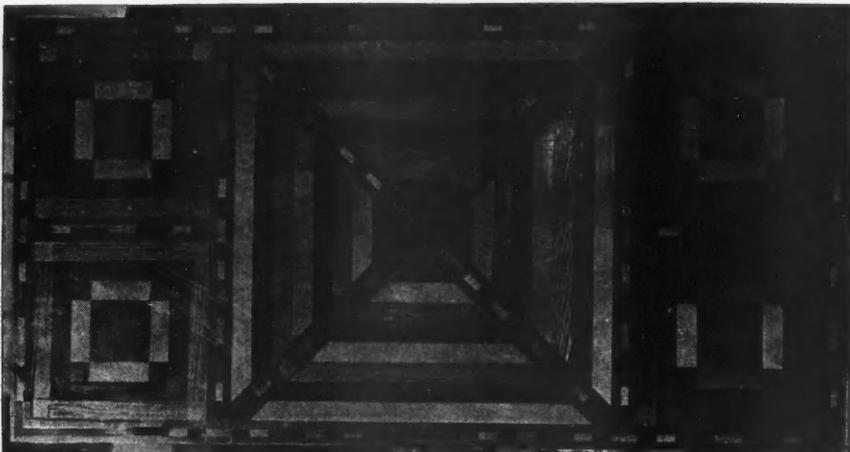
To the Editor: Hudson Falls, N. Y.
 Some years ago I saw in some of the concrete journals an advertisement of a small grinder to grind over cement that had become hard and lumpy in the shop. If there is anything in that line now I would be pleased to locate it.

WM. J. DEMPSEY.

Has Time Sheets to Figure Costs

To the Editor: Seaside Heights, N. J.
 I am enclosing form of time sheets I use. I find them very complete as they give me a daily check on how each job runs, and on completion give me an accurate cost account of each particular job. You will note that the foreman's sheet provides charges and credits where material is transferred from one job to another, and has provisions for charges on extra work. I would like suggestions as to improvement in this form of sheets as I expect to have a new supply printed before long.

CLYDE G. MARCY.



Top of Inlaid Table. It Is 22¼ by 43¼ Inches. Eight Different Woods Were Used in This Table. It Is 31 Inches High.

Check No. B _____ Checked by _____ Number _____
 Week Ending Thursday _____

CLYDE G. MARCY, Contractor.

Rate \$ _____ Hours _____ Amount _____ Deductions \$ _____ Net \$ _____

Name of Job	Amount of Work Done	P	S	M	T	W	T	Hours	C'ntr'cl	Charge	Total
											\$

FOREMAN'S REPORT Job _____ Date _____ No. _____

CLYDE G. MARCY, Contractor

Foreman

Employee	Amount Fwd.	Kind of Work	To Date	Hours	Rate	Labor on Contract	Labor Charged	Material Contract	Material Charged	Credits	Material Received on Job
											State from where received

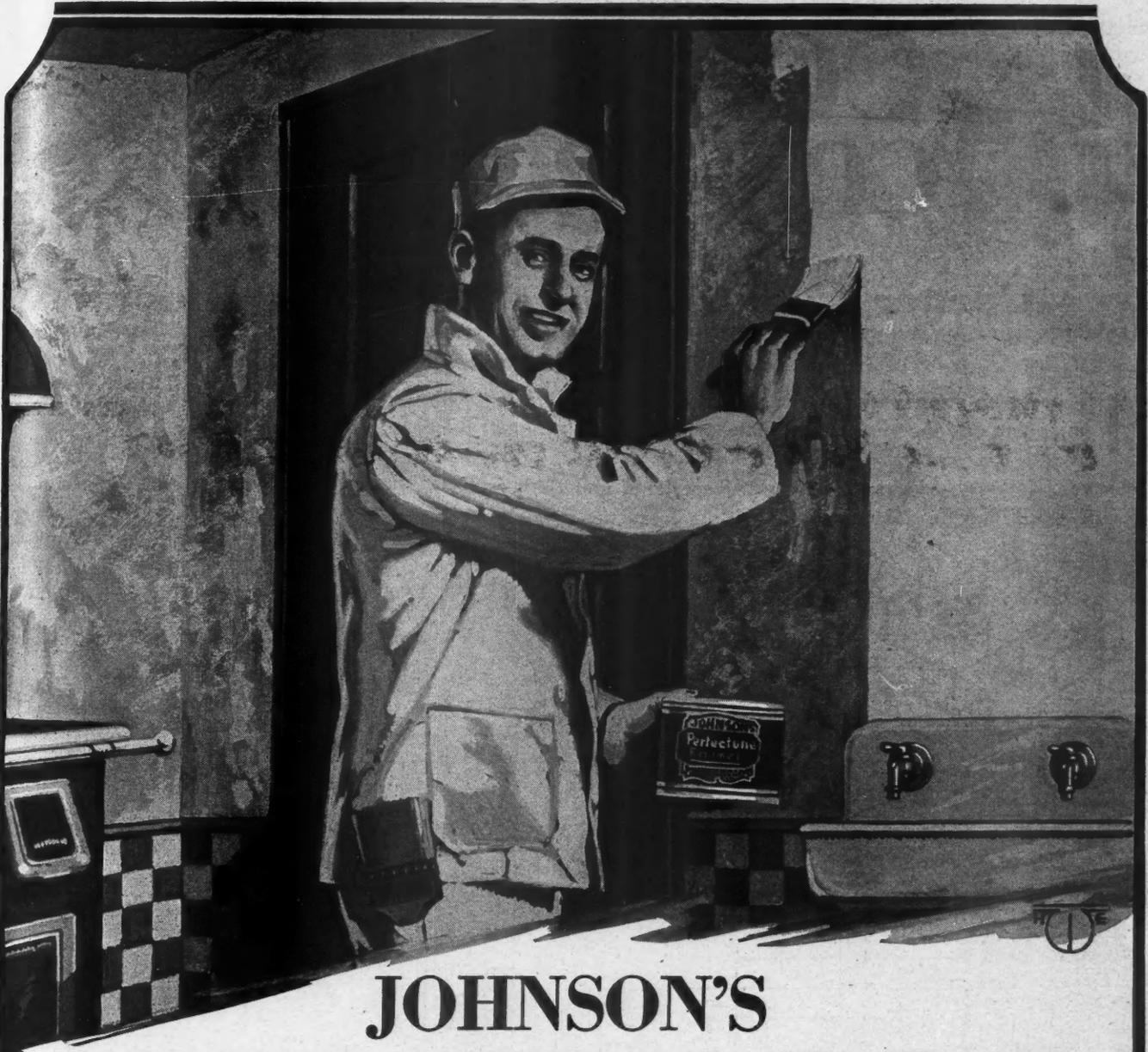
Material Taken from Job.
 State to where taken.

Total

Making Newel Caps on Machine

To the Editor: Lake View, N. J.
 I wish some of your experts would tell me how to get out caps for newels on a spindle shaper or variety machine. They are about 4 by 1½ inches and are difficult to hold on the last edge. I have not worked on machines very long and don't like to get stuck. So far I have made them, but it is risky for the fingers. I do not think the shaper is the proper machine to work them out on but it is the only kind we have.

G. T. HINKS.



JOHNSON'S PERFECTONE UNDER-COAT AND ENAMEL

YOU can turn out perfect work—satisfy your trade and complete more jobs if you will use Johnson's Perfectone Under-Coat and Enamel for finishing interior trim. The stock shades are White—Ivory—and French Gray, but we are in a position to furnish any other shade for large jobs upon receipt of sample.

Johnson's Perfectone Enamel is exactly right for the expert finisher and will always give perfect results for the unskilled workman. It works freely under the brush and is quick drying. It will not fade, chip, check or peel.

Johnson's Perfectone Enamel is made in Satine and High Gloss. We recommend the use of the Satine everywhere except in kitchens and bathrooms where a High Gloss may be desired. Johnson's Perfectone Enamel Satine has just enough gloss and not a bit too much. It gives a beautiful, artistic hand rubbed effect without the expense of rubbing, but it may be rubbed if desired. Johnson's Perfectone Enamel is elastic and durable. It stands repeated washing with soap and water.

S. C. JOHNSON & SON, Racine, Wisconsin
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Johnson's Perfectone Under-Coat works easily under the brush and can be flowed on and brushed out free from brush marks. Dries hard with a smooth, velvety sheen—requires very little sanding.

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 ADDRESS
 I buy from



CONCRETE CONSTRUCTION



Corner Construction of Concrete Block

ARTICLE II OF A SERIES ON RECOMMENDED PRACTICE FOR CONCRETE BLOCK AND TILE CONSTRUCTION.

By A. J. R. Curtis

IN order to keep mortar joints breaking at the midpoint of block in the alternate courses, it is usually necessary to provide special blocks at the corners. These blocks may be either of special shape or of special length. Since it is always good practice

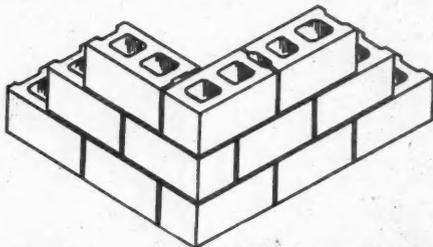


Figure 1. Corner Construction with One Piece Hollow Concrete Block Where Wall Thickness Is Equal to Half of the Block Length. In This Case the Corner Block Is of the Same Dimensions as Full Length Block. No Special Shape Is Required.

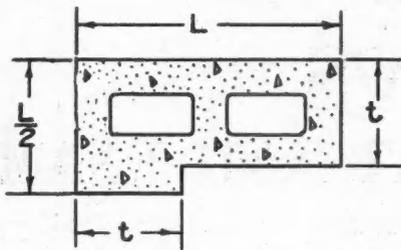
and usually most economical to avoid special units as far as possible, corners should be so laid out as to require the smallest possible number

of specials. In planning the corner layout only two dimensions need usually be kept in mind, the length of

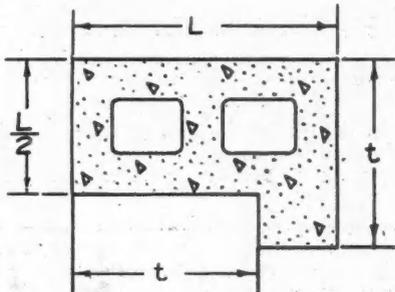
the full wall block, usually indicated by L, and the wall (block) thickness indicated by t.

When the construction is such that the wall thickness (block thickness) is equal to half the block length L, thruout the entire structure, corner block are of same dimension as full length block and the layout is simple as indicated in Fig. 1. If faced block are being used, the corner will be identical with the full length block except for a surfaced end; if the wall

is to receive a stucco surface, full length block are used at the corner, no special corners being required. No difficulty will be encountered making this layout if quarter, half and other odd lengths of block are kept away from the corners.



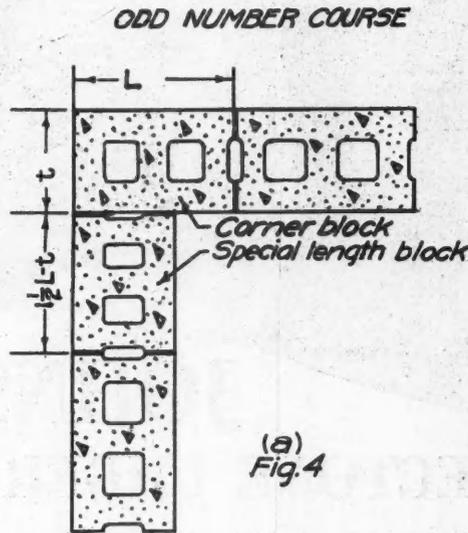
Where $\frac{L}{2}$ is greater than t



Where $\frac{L}{2}$ is smaller than t

Fig. 2

Figure 2. Special Shape Corner Block for Use Where Thickness of the Wall Is Greater or Less Than Half the Block Length.



(a) Fig. 4

See Page 116 for b and c of This Diagram.

is greater or less than half the block length. If so, special corner construction is required, preferably by the use of the specials shown in Fig. 2. Notice that

where the wall thickness is less than half the block length the shape of the corner will be as shown in the

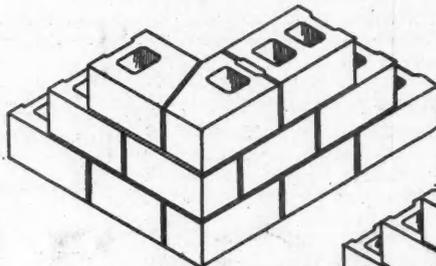
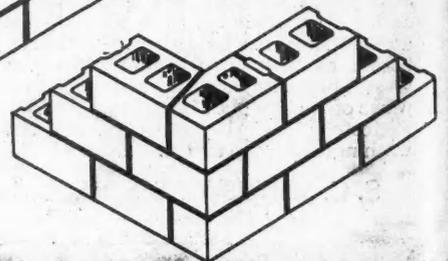


Figure 3. Corner Block of Common Design for Use Where Wall Thickness Is Greater Than Half of the Block Length. These

Have the Disadvantage of Requiring Two Special Non-Interchangeable Blocks at Each Corner, While Only a Single Special Is Required When Shapes Shown in Fig. 2 Are Used.



ROOF VALUE

ROOF VALUE means more than good looks, more than complete weather protection, more even than long life.

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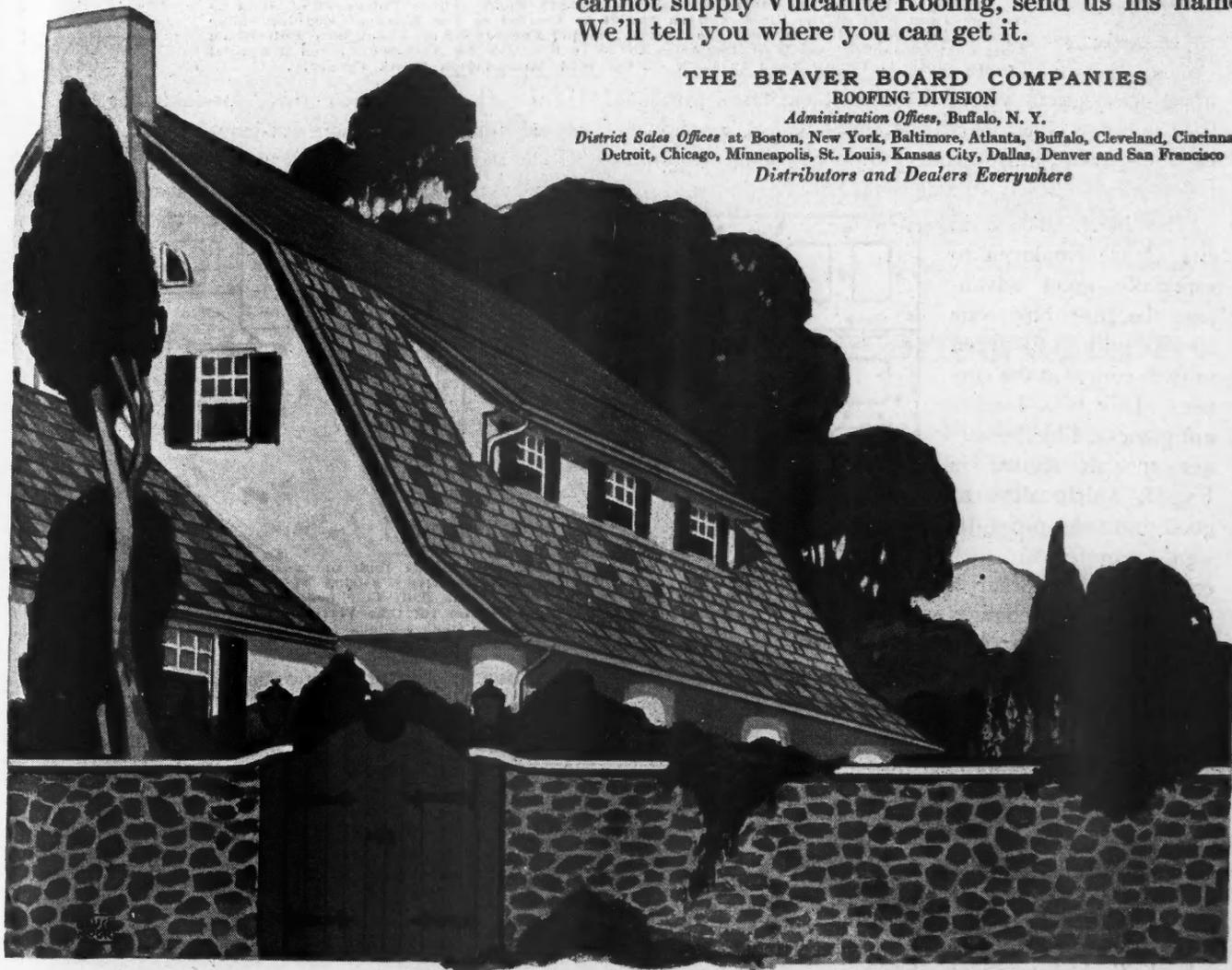
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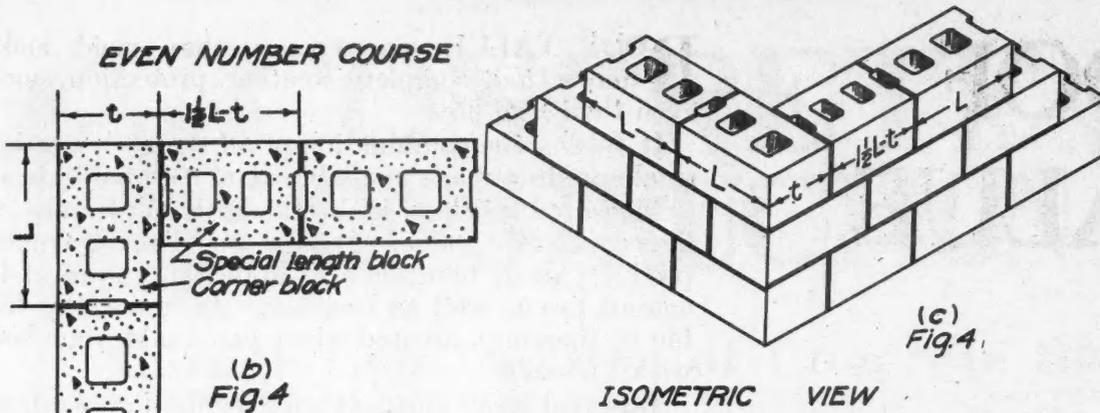


Figure 4. Position of Corner and Special Length Block Where Thickness of Wall Is Greater Than Half of the Block Length and It Is Desired to Use Block of Regular Shape But Special Length in Preference to Special Shaped Corners. For Example a Full Block Length of 16 Inches and Wall Thickness of 10 Inches May Be Assumed. Then a Special Length Block 14 Inches Long in Each Course Will Make Joints Break Properly.

regular full length corner block in each course, to the side of which is placed a special length wall block with a length equal to one and a half times the full block length less the wall thickness

upper illustration; where the wall thickness is greater than half the block length the shape will be as shown in the lower illustration. These specials become reversible by merely turning over.

($1\frac{1}{2} L - t$). In practice this "special" length block is often a stock size fractional length block.

If the thickness of the wall varies above the ground, it will be usually found desirable to use the scheme

The block shown in Fig. 2 are employed to especially good advantage because only one special unit is required in each course at the corner. This is a feature not possessed by the corner specials shown in Fig. 3, which, altho of good and substantial design, require in each course at the corner a pair of non-interchangeable specials.

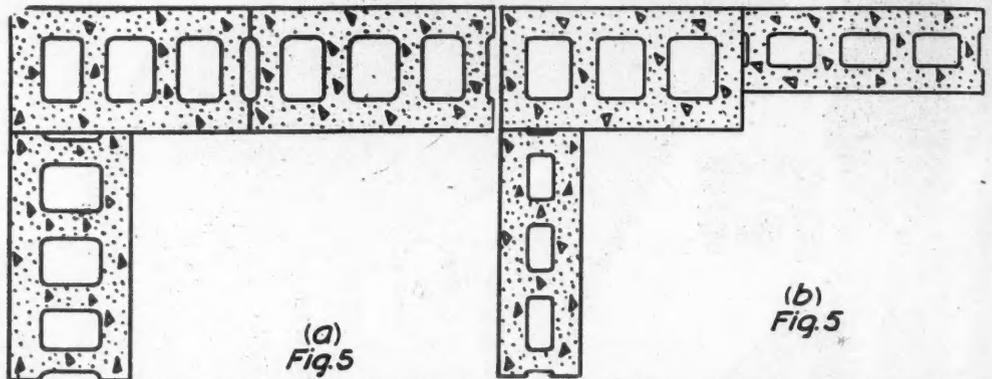


Figure 5. Sketch (a) Shows the Position of 12 by 24 Inch Block at Corner of Foundation Wall 12 Inches in Width, and Sketch (b) Shows the Relative Position of Block in Corner of a Corresponding Course Higher in the Structure Where the Wall Thickness Is 8 Inches. Notice That 12 by 24 Inch Block Is Used in the 8 Inch Wall in Order to Make Vertical Joints Break Properly Around the Corner. Where the Interior Overhang of the Corner Block Is Objectionable, Construction Shown in Figs. 2 or 3 Should Be Used.

The three sketches shown in Fig. 4 illustrate a simple solution for the corner work where the thickness of the wall is greater than half the block length. In this case the joints next to the corner do not break at midpoint, but little or no injury is done to the appearance if these joints are carried up consistently, so that they are in a vertical line from bottom to top. The corner is made by a

shown in Fig. 2 in preference to that shown in Fig. 4, as changes in wall thickness mean corresponding changes in the location of the vertical joints nearest the corner, and necessity for varying the length of the special wall block.

For the construction of sheds and unplastered buildings, where a producing offset on the interior of the wall at the corner would be of no consequence, the arrangement shown in Fig. 5 may be used. Sketch (a) represents a basement wall of thickness equal to half the block length. The width of the wall, for example, may be 12 inches. One or two stories above,

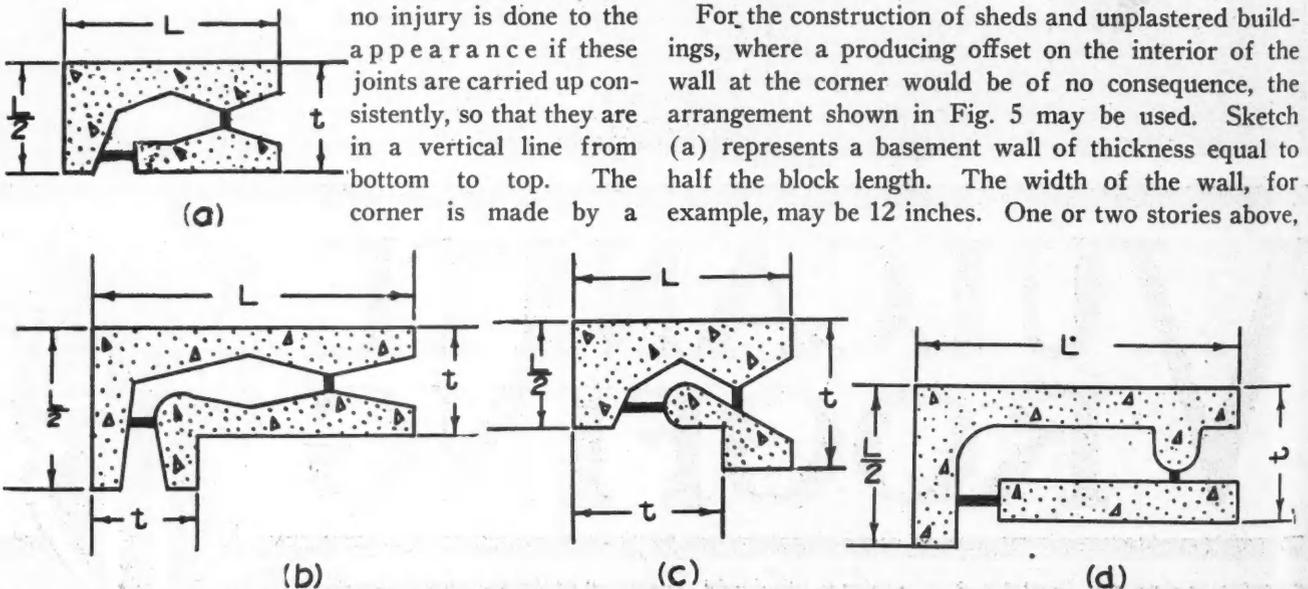
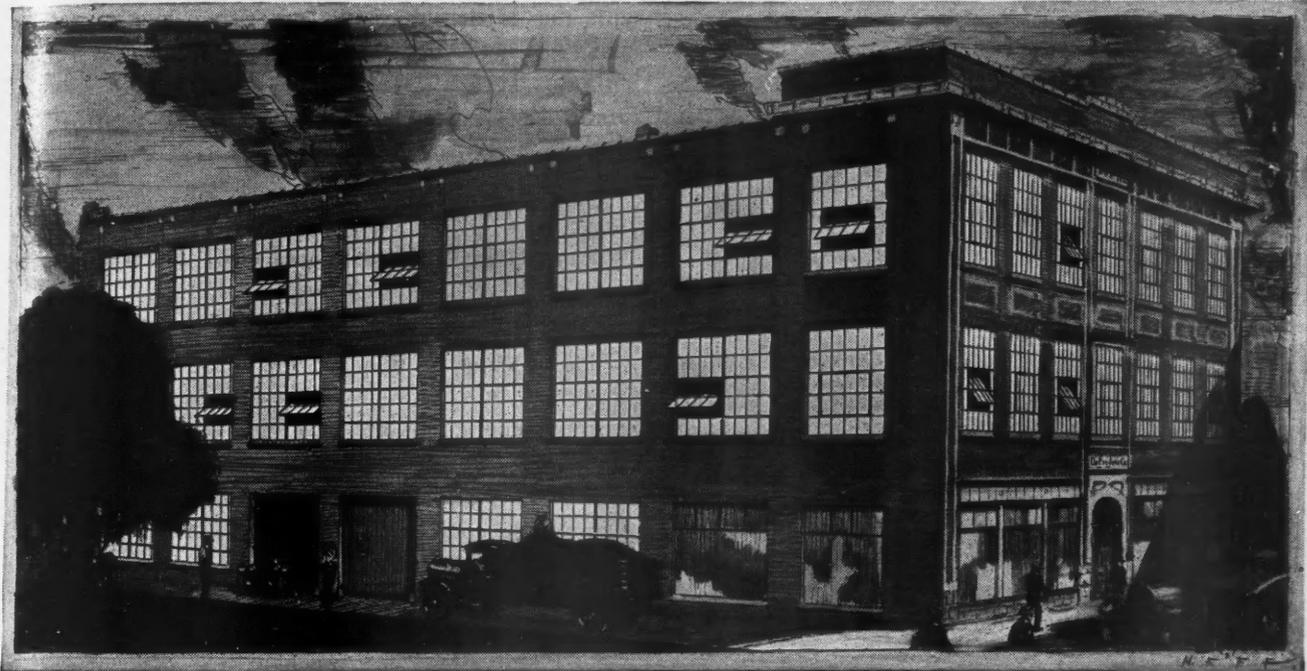


Figure 6. Corner Block for Two-Piece Block Systems Using Metal Ties. Sketches (a), (b) and (c) Show the Anchor Block and Sketch (d) the Bradstad Block.



DuPre Auto Company's Building, Columbia, S. C.

J. B. Urquhart, Columbia, S. C., Architect

WindoWalls—For Garage Construction

As an example of modern tendencies in garage construction, this new building of the DuPre Auto Company at Columbia, S. C., gives a significant prominence to the economy and service of Fenestra WindoWalls.

"We are so well pleased with Fenestra Windows that we will use them in two other garages we are building. They provide light and ventilation—the two things we consider essential to properly conduct our business.

"There is a very definite economy, aside from first cost, for our building is so much better lighted that we save considerable in artificial light bills, and it is so well ventilated that the use of fans is almost eliminated.

"Just add to the above the very important factor of better working conditions and you will see that we acted upon quite substantial reasons in specifying Fenestra."

Pres. DuPre Auto Co.

Detroit Steel Products Company

1234 East Grand Boulevard, Detroit, Mich.

Canadian Metal Window & Steel Products Limited, Toronto, Canada



Fenestra

STEEL WINDOW WALLS

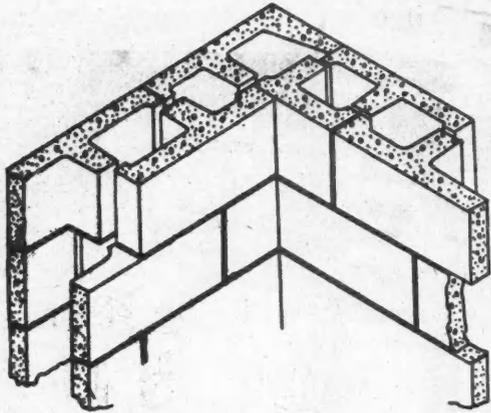


Figure 7. Corner Construction, Showing Use of Full Length Corner Block.

where the wall thickness is only 8 inches, the construction would be as shown in sketch (b), employing a corner block of thickness equal to half the length (in this case 12 inches) in order to make the joints break properly. This leaves a protruding interior offset of 4 inches.

Where Two-Piece Air Space Block Are Used

Where two piece block systems using iron ties are employed, corners are usually constructed by means of the specials shown in Fig. 6. Detailed description is hardly required if a comprehension is gained of corner construction for one piece block, as given above. The anchor block system is used for varying thicknesses of wall and length of block, requiring one or more of the three corner specials shown in Fig. 6 sketches (a), (b) and (c). The Bragstad system (corner shown in sketch d), is usually employed only for 10-inch wall thickness.

A great deal of leeway is permitted at the corners



Figure 8. System Illustrating Use of Special Length Corner Block.

with the Hydrostone and other two piece systems using no metal ties. Fig. 7 shows a typical corner with this system, and Fig. 8 photographic reproduction of special corner construction necessitated because the length of the wall did not equal an even number of block lengths.



Erecting Lightning-Proof Buildings

(Continued from page 103.)

tion) are frequently struck.

The rodding of a house or other structure is an important task and should be done by a man who thoroly understands his business. The job of equipping buildings with lightning protection has become a very prosperous one and is now being done by carpenters and contractors in many communities because they are the logical men as actual builders. Backed up by the guarantee of reliable manufacturers they have succeeded in instilling confidence in their customers and dissipating much of the unsavory reputation which fakers acquired some years back.

Today the lightning rod business is thoroly legitimate and a lucrative source of income for the progressive builder who is not only protecting his client but insuring complete satisfaction, which is the greatest salesman he can use.

In giving the client the cost or number of feet required for the barn, the builder first ascertains the length of the barn plus rafters on each side, plus the length of the studding on two opposite corners, plus five feet for over shoot on one end of the gable where the hay tool is fastened, plus ten or fifteen feet for the cupola plus 20 feet for ground. These figures are by no means absolute but are used to illustrate what measurements should be taken.

In lightning rod construction it is important to get sufficient rod into the ground to insure good earth connection as the rod derives its whole power from the ground connection.

Lightning rods are needed wherever there is a building, large or small, house or barn, factory or office building, regardless of the material of which it is constructed. In his position as advisor, the contractor has unusual opportunities to sell this equipment as an important accessory of his business.



To Eliminate White Ants Already Established in Buildings

PROMPTLY examine the foundation timbers and other woodwork in the basement to determine the approximate point of entrance and the extent of damage already accomplished. After removing the damaged wood drench the ground with kerosene oil.

Then replace damaged timber with rock, brick, concrete, or metal work; or substitute, for the foundation, timbers impregnated with coal-tar creosote|



try **THIS**
hand once!

The Hawkeye Lightning Rod Agency opens the way to a side line that will pay you big money right from the start and is unending in its opportunities.

Every barn, home or public building that you build will be rodded sooner or later and it's up to you to see that this easy money goes your way.

The government and every big farm paper is advocating the use of good lightning protection.

The public wants it and it's up to you to grasp this opportunity now.

AS FOR QUALITY

The Hawkeye System provides the best lightning protection in the world.

In a period of 20 years 120,000 buildings have been equipped with this system without a single loss.

36 strands of pure soft copper cable are woven into this rod with an auger-shaped center strip of **pure soft copper**. This feature keeps the ground rod moist at all times and every strand is exposed to the surface.

YOU GET THE EXCLUSIVE AGENCY

Don't wait for some other fellow to see this opportunity. See us first!

Write today for our Proposition

We help you in every way with advertising, expert advice and a book of selling helps.



AB 8

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Please send me full details of your Exclusive Agency Offer to carpenters and builders. Also free samples, catalog and prices.

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Making the Factory Attractive and Safe

BRIGHT, WELL VENTILATED OFFICE BUILDING AND MODERN DISPENSARY TWO IMPORTANT PARTS OF ILLINOIS PLANT

By Herbert C. Crocker

THE accompanying illustrations and plans are those of a recently completed office building and dispensary of a large Illinois manufacturing company spending large sums to make the surroundings for the office force and workmen more pleasant and equally as much for their protection and against injury, at the same time providing a place to give them first aid in case of injury. At every available place in the plant the company maintains a sign, electrically lighted at night, urging the men to take care.

In a prominent place there is also a bulletin board with interchangeable letters, and every few days something new is put up to attract and urge the men to be more cautious. Thru the plan the number of broken bones and lacerated flesh is being reduced to a minimum.

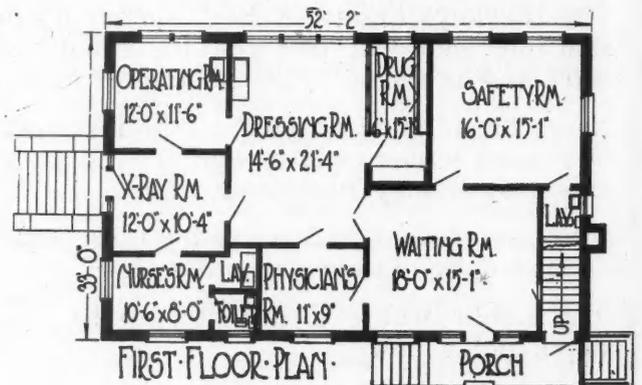
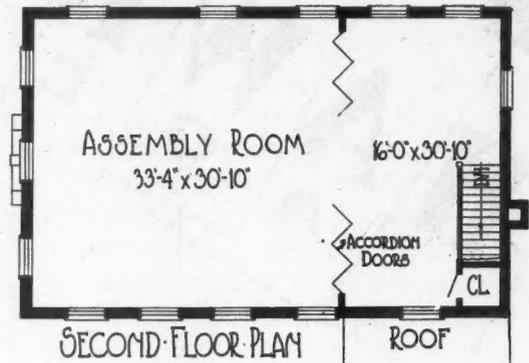
The office building is a light and airy structure, the long hallways adding much to the ventilation of the building. If necessary to close some of the windows to keep out fumes arising at the plant, there are still enough to let in needed fresh air.

The lower floor is given over to various departments and may easily be arranged to suit any sort of business. Considerable space is set aside for vaults in which to store valuable records used from day to day. Additional vaults may be arranged in the basement as a storage space for those needed in future years.

Entrance to the plant is thru a portion of the building at the rear. Timekeepers, checkers, watchmen and the paymaster may utilize parts of the space to carry on their work.

There are toilet facilities on the first and second floors, those on the upper being for women.

A large dining room and kitchen are features of



Floor Plans of Dispensary Building Showing Various Rooms on First Floor for Treatment of Patients and Large Assembly Room Upstairs for General Purposes, Health Lectures, Etc.



Dispensary, One of the important Units in the Efficient Plant of the National Enameling & Stamping Co. at Granite, City, Ill. It Contains Complete Hospital Equipment and Is an Ideal Building for a Small Sized Factory Town Which Does Not Have a Hospital.

the second floor. They are used by the office force and department heads in the plant making an ideal place for the officers to discuss plans after lunch while the men enjoy cigars. This plan is followed by several in the city where non-day lunches and a social hour have been proving a success.

The directors of the company have quarters on the second floor for private conferences. The rest of the upper floor is portioned off for offices.

Altho the dispensary adjoins the office, it also has a dining room where physicians, nurses, attendants and patients who are able may eat without going out in bad weather. The dining room and kitchen are in the basement, which is not set very deep in the



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The founder of The Beckwith Company inspired his first band of men with the Round Oak standard in 1871 when he said to them, "Make good goods only."

By their side he toiled for years to hasten the day when people should regard *Round Oak* on a heating or cooking appliance with a trust such as they repose in the carat mark on gold.

That day arrived, and more than two million families—each served faithfully by a warm air heating system, range or stove symbolized by the Round Oak Indian—now witness the extent to which this rigid standard has been of material profit and benefit to humanity.

Today a great colony of artisans is earnestly at work, imbued with the spirit that they who are the present generation of Round Oak Folks shall make good goods only, as did their forefathers.

It is the knowledge of this unvarying standard of excellence that leads a public to accept the name Round Oak as a guarantee of satisfaction.

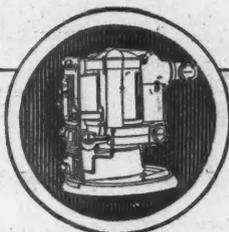
Measured by the years that any Round Oak will deliver a good and economical service, invariably it costs the least to possess.

The Beckwith Company, Dowagiac, Michigan
"Round Oak Folks" Established 1871

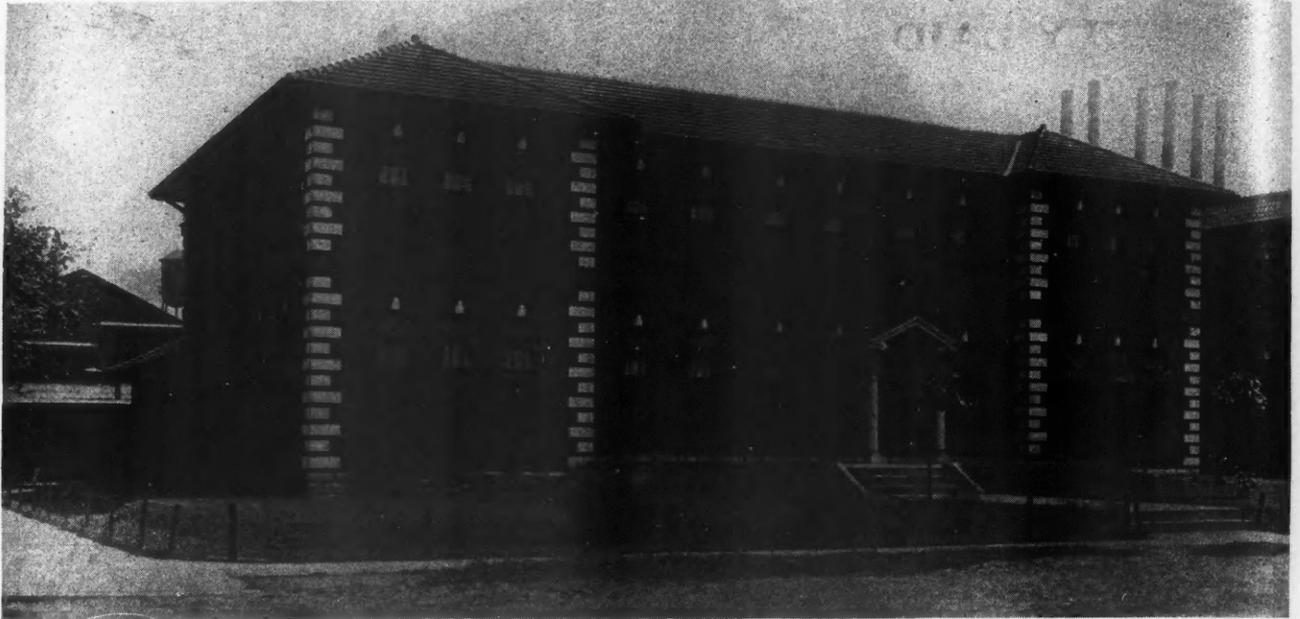
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STOVES AND HEATING SYSTEMS

In considering your own heating requirements or those of your customers you will be guided to a correct decision by the trade mark and trade reputation of ROUND OAK



WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER



Building Devoted to Offices. The National Enameling & Stamping Co. Believe in Spending Plenty of Money to Make the Surroundings for the Help Both Pleasant and Safe. This building is Light, Well Ventilated and Efficiently Laid Out.

ground. They are walled off from the boiler and coal room.

The dispensary has every modern necessity for surgery, equal to the equipment of many big city hospitals. There is an X-ray room, adjoining the operating room and conveniently located to the quarters of the nurses and physicians' office.

Another feature is the dressing room with a well supplied drug room in connection. A waiting room and safety room are features of the first floor.

The upper floor is used as an assembly room for various purposes. It might easily be arranged for patients.

A dispensary of this type is ideal for the smaller-sized factory towns which are without a city or private hospital.

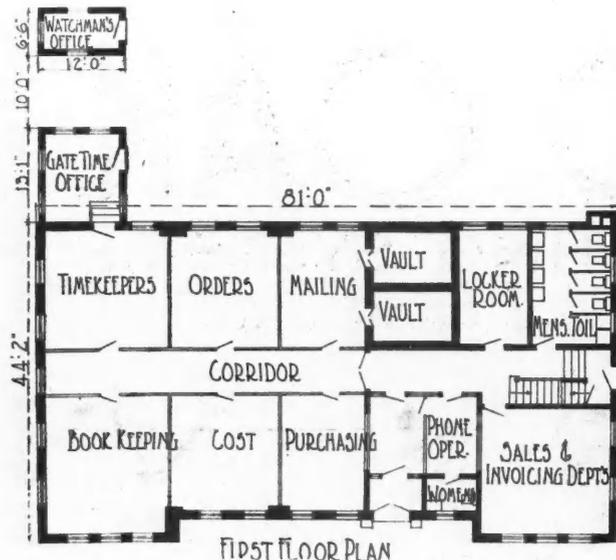
A RECENT North Dakota law permits the state to accept deposits from citizens for home-building purposes. When one-fifth the necessary amount has been deposited, the state advances the other four-fifths, taking a mortgage to secure its loan and assessing interest at 6 per cent with an additional 1 per cent for administration expense.



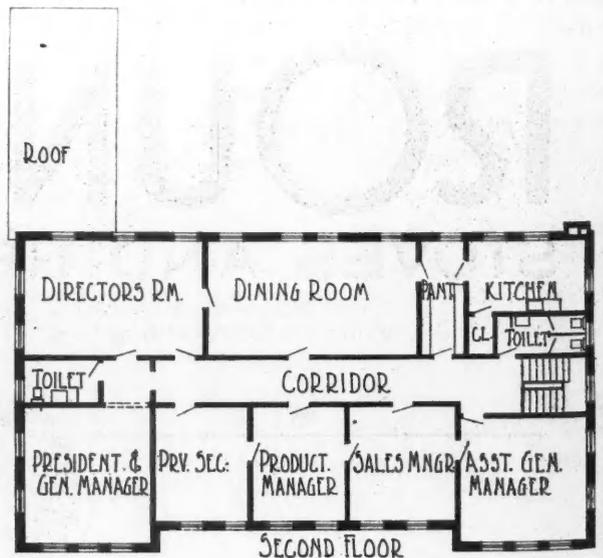
HOUSING troubles are not confined to the United States—the situation in Berlin is so acute that cells in the city jail are being rented to care for the people who would otherwise be homeless.



WHEN in doubt, build.

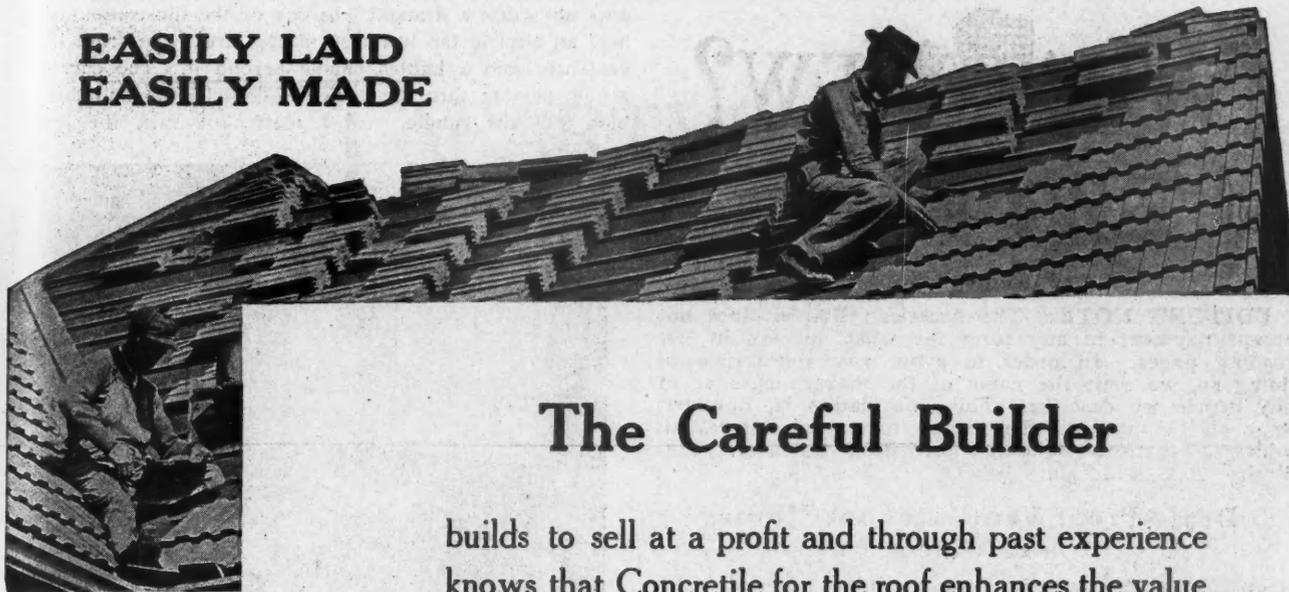


First Floor Plan of Office Building. This Floor is Given Over to the Various Departments and Vaults for the Storage of Records.



Second Floor Plan Showing General Offices, Dining Room, and Directors' Room.

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EASILY MADE**



The Careful Builder

builds to sell at a profit and through past experience knows that Concretile for the roof enhances the value of property in the eyes of a prospective buyer because of its beautiful appearance and wearing qualities.



"A roof for all time"

- No Wear
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- Fireproof
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- Low in Cost
- Interlocking
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- Different Colors

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Size of one Concretile 9" x 14 $\frac{3}{4}$ ".
 Weight 5 pounds.
 Surface exposed to weather 8" x 12".
 Number of Concretile to square (100 sq. ft.) 150.
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WALTER CONCRETILE CO.

414-18 Saks Bldg.

INDIANAPOLIS, IND.



Indiana Tuberculosis Hospital. These Roofs Are Covered with Silver Gray "Concretile."

W. E. Ross, Architect.



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Draft-Proof Ventilator for Homes and Offices

EVERY twenty-four hours each occupant of a room breathes approximately twenty-eight thousand times and renders unfit for breathing nearly one cubic foot of air per minute. In home, office and school rooms as they are ordinarily constructed and occupied, there is serious impairment of the quality of the air to be breathed, even to the point where it becomes a menace to health, for the quality of the air which we breathe is of more importance to health than the quality of the food we eat. An efficient system of fresh air supply is the only practical remedy for this quite serious evil.

A ventilator has recently been put on the market that promises to furnish this supply. Naturally it is attracting considerable attention among builders as well as home owners. This ventilator is a metal device, rather a series of louvers so arranged that it can be placed in the window between the sash and the sill. When placed in position it allows fresh air to come into the room but deflects it so that it rises and



Adjusting the Ventilator to the Width of the Window. It is Made in Three Heights, 8, 12 and 18 Inches, and in Stock Sizes to Fit Windows 22 to 60 Inches Wide.

does not cause a draught. In one of the illustrations shown here an electric fan has been placed directly in front of this ventilator and a lighted candle beyond it. The current of air on passing thru the device is deflected up and does not blow out the candle. As a matter of fact, the light is

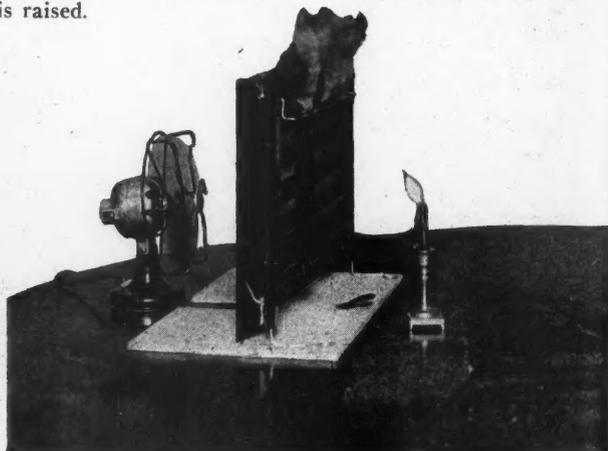


The Fresh Air Enters the Room But Is Deflected Upward so There Is no Trace of Draft When a Person Sits Next to the Window. The Arrangement Also Prevents Rain from Coming Thru.

drawn towards the ventilator showing the suction caused by the upward deflection.

The air upon entering the room is deflected upward, and if cold, is warmed by the air in the room with which it mixes. In this way all possibility of draught or cold air is eliminated. The louvers of this ventilator are so constructed that it is not likely that rain will penetrate to spoil the curtains.

It is made in three heights, 8, 12, and 18 inches. Each size is adjustable as to length. Stock sizes will fit windows from 22 to 64 inches in width. The device is not fastened to the window but is built to fit in the jamb when the sash is raised.



Unique Experiment in Which Fan Is Turned on Directly in Front of Appliance. The Flame of the Candle on the Other Side is not Blown Out But Attracted Toward the Ventilator by the Upward Deflection of the Air.

APARTMENT HOTEL FURNISHINGS



The complete equipment for the luxurious Sherburne Beach Apartments was furnished by Albert Pick & Company.

SHERBURNE BEACH APARTMENT
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THE selection of the furnishings and equipment for an Apartment Hotel is a matter of expert knowledge and experience. In our organization are the country's leading authorities on Apartment Hotel furnishing and equipment, who are always available for planning and consulting service. We can engineer the complete planning, furnishing, interior decorating and equipment of the largest apartment hotel, or handle the smallest supply requirement with equal facility. Our sixty years of successful business life are an ample guarantee of our integrity and reliability.

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Draperies
Dining Room Service
Kitchen Equipment

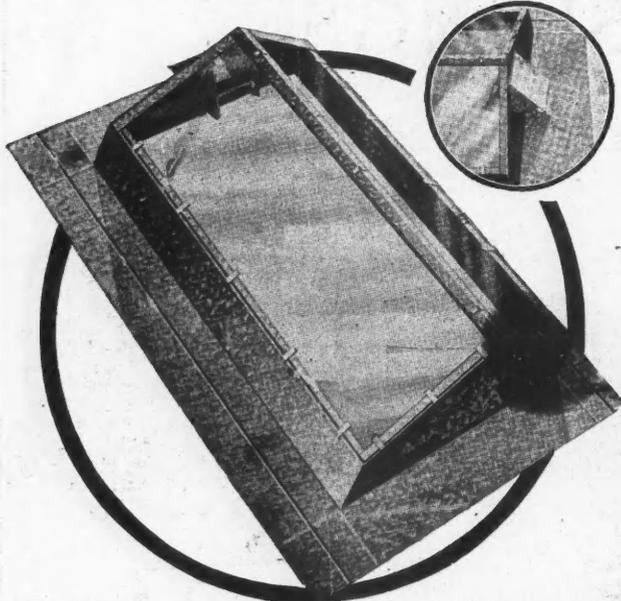
Write for Catalogs and Information

Shall We Send Our Representative?

ALBERT PICK & COMPANY
208-224 WEST RANDOLPH STREET CHICAGO, ILLINOIS

Hog House Window Has Ventilator

FARMERS everywhere are paying more attention to the healthful and sanitary housing of their hogs. In their contracts with builders they insist upon this particular feature. That is the main reason for the popularity of modern hog house windows. A further development in this kind of construction has been made by the introduction of a hog house



Peak Roof Type of Hog House Window with Special Ventilating Arrangement in Upper End. The Small Picture Gives a Close-up View of This Ventilator.

window with a ventilator installed, as the illustration shows.

This hog house window is of the peak roof construction type which helps to eliminate dirt catching screens and throws sunlight into the houses at all hours of the day.

The ventilator is in the upper end of the window, so placed to let the foul air rise and escape. It is so arranged that snow or rain cannot get in when it is open wide.

The sloping window panes afford a large reflecting surface and are made of clear, not frosted glass. A small gutter in the flashing at the edge of the shingle line carries the water off and prevents it from getting under the edge of the shingles. This peak roof is designed to render the window less likely to be broken by falling articles.

The outside dimensions of the flashing on these windows are 28 by 39 inches. The height of the peak is 9½ inches. The size of the opening in the roof is 20 by 30 inches. Each glass is 12 by 30 inches.

Machine for Bending Reinforcing Bars

VERY often out on the job contractors have to bend reinforcing bars to fit certain positions. If the bar is heavy and not very pliable, he is confronted with a task that is by no means easy and if he must bend a number of bars, he will lose considerable time.

To eliminate much of this trouble, a bar bending machine has been devised that is light and easy to carry about. It can be attached to a permanent frame in a shop or can be attached to any makeshift stand right on the job. It is made in two sizes. The first size will bend cold reinforcing bars 1½ inch round or square, while the other size will take care of 1¼ inch bars.

By means of this small device the contractor can bend the reinforcing bars to various angles for all purposes in concrete work. The bending posts between which the rod is laid are constructed of turned

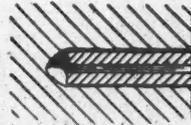
steel, the post revolving thru the slot in the plate being equipped with a loose steel roller to prevent creeping of the bar in bending.

The machine is furnished with a detachable handle 7 feet long which the workman operates as shown in the accompanying illustration. It is a convenient machine to have in the shop.

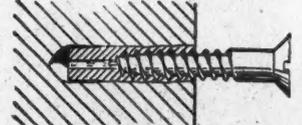


New Wall Plug Prevents Damage

BUILDERS are continually confronted with the disagreeable task of fixing screws into walls for holding brackets, fitting pipes, cables, wires, etc. Under ordinary conditions the practice has been for the workman to cut away stone, brick, con-



Section Showing Plug in Position Ready for Screw.



Screw Entering, Showing Expansion Plug Against Side of Hole.

crete, or plaster to insert a wood plug first. This called for considerable time and trouble, not to mention the damage to the wall.

If the fixing was in a position where vibrations were frequent the plug invariably came loose.

A new plug, which was recently devised by an English inventor, is designed to eliminate this delay and damage. This plug consists of a tube of stiffened fibres which automatically expand when a screw is driven into them, thus obtaining a firm fixing. To place in position, all that is necessary is to drill or jump a very small hole, push the plug into position and turn home the screw. In this way the old method of cutting a large unsightly hole with a cold chisel, making a wood block to fit and then wedging or cementing into position, is eliminated.

These plugs are made in various sizes and lengths. In cases where making holes by brace or drill is inadvisable, a plug tool has been devised. This tool makes a hole of the size required for the fibre plugs.



This Refrigerator Supplies Own Ice

A FULL ice box or its equivalent day and night, winter and summer, without giving any thought to the subject—these are the achievements of the new home refrigerator.

The mechanical refrigerating system of the machine con-



Bar Bending Machine for Bending Reinforcing Rods on the Job. It Is Light and Can Be Carried Around from Place to Place Without Trouble.

-- Exclusive Features You Have Been Looking For in an Asphalt Shingle --

Monarch Radiant Shingle

(LATITE PATENT)

Impossible to Curl Under any Condition

Less Nails than any Other Shingle

Look the Same on Old Wood Shingles as on Sheathing

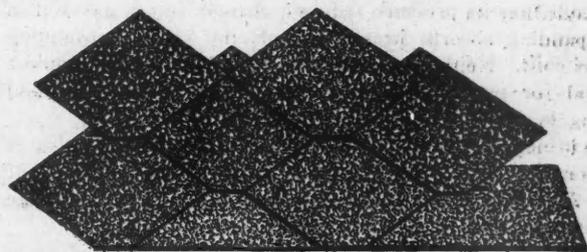


RADIANT SHINGLES OVER OLD WOOD SHINGLES

SINCE early in 1918 the Radiant Shingle has been subjected to every possible contingency on roofs in actual use. On trial under all kinds of severe conditions they stand up in first-class shape. On experimental roofs from Florida to Minnesota to Maine over **THREE MILLION** square feet of Radiant Shingles have been applied with entire success.



Surface and back of shingles



Shingles as applied

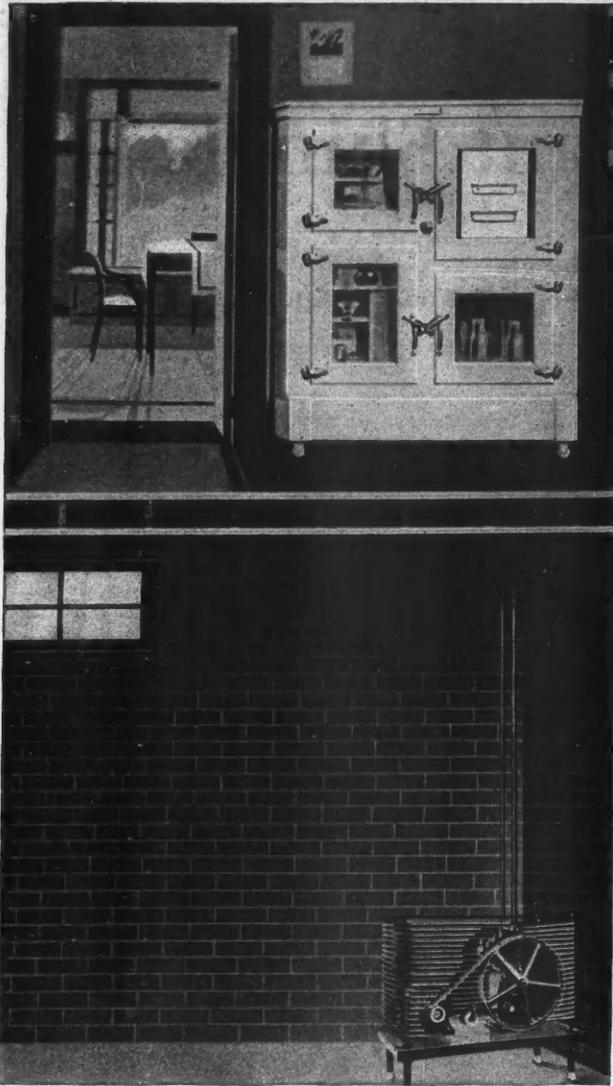
Radiant Shingles just cannot curl — the wire staple prevents. Can be applied at less cost than any other shingle as they require only 160 nails to the square. In addition the first cost is lower. The butt is double thickness at the right place. There are no waves or ripples when applied over old wood shingles. Only the best raw materials are used and these shingles are backed by our 28 years experience as roofing manufacturers. Write for literature.

Monarch
Roofings and
Strip Shingles

STOWELL MFG. CO.

ESTABLISHED 1892

670 Culver Ave.
Jersey City,
N. J.



Cross-Section View of First Floor and Basement Showing Location of Ice Box and Ice-Making Machine. It Provides an Ice Service of 200 to 400 Pounds a Day.

sists of a brine tank filled with cooling coils, a motor-driven compressor and a condenser of copper tubing. The principle involved, simply stated, is that the compressed liquid sulphur dioxide, on passing thru the expansion valve into the brine tank coils, has its pressure reduced, changes into a gas and in so expanding absorbs heat and cools the brine surrounding the gas coils. Neither brine tank nor sulphur dioxide requires renewal for several years, since each is sealed airtight and nothing in the operation exhausts either.

The brine tank fits into the ice compartment of a refrigerator and comes in three sizes, corresponding to an ice service of about 200, 300 and 400 pounds of ice a day, or an ice storage capacity of about 150, 200 and 250 pounds.

The motor, condenser and compressor are mounted on a base 30 by 16 inches and the entire unit stands 18 inches high. This unit is the same size for all refrigerators and is placed in the cellar, while the ice box and brine tank are in the kitchen, pantry or other convenient location, the connection being made with two copper tubes, which respectively carry up the liquid sulphur dioxide and bring back the gas for compression and liquefaction.

In the New York Tribune Institute testing experiment, a theoretical test to determine the heat balance of the apparatus indicated that if the motor ran all the time the cooling effect would be about the same as produced by melting 300 pounds of ice per day. This estimate of the refrigerating capacity of the machine is in accord with the claims made by the inventor.

On top of the brine tank is located the expansion valve thru which the liquid sulphur dioxide enters the brine tank and to the right is located the thermostat which controls the starting and stopping of the motor automatically. The sulphur dioxide flows thru the eight coils around the bottom of the thermostat before it is drawn back to the compressor, and the change in temperature of the small coils just beneath the thermostat starts and stops the motor. The thermostat may readily be removed and replaced should it need adjustment, without interfering with the operation of the machine.

When the temperature rises to 39 degrees in the ice box (corresponding with 27 degrees inside the brine tank, as indicated by the freezing of the cubes of ice in the lower part of the tank itself), the motor goes to work. At this point the food chamber below the ice box is about 38 degrees, and the motor runs until the thermometer has fallen one degree, showing that the thermostat maintains an even temperature.

Two trays are located in the refrigerating unit for making blocks of ice for beverages, etc., turn out 42 cubes every three or four hours, each measuring 1.5 inches square by 1 inch thick. The larger type refrigerator has three of these trays. —Earle W. Gage.

New Garage Door Holder

CONTRACTORS who make a specialty of garage building will be interested in a new garage door holder which has recently been devised and placed on the market.



New Garage Door-Holder Designed for Heavy Doors. It Is Reversible for Right and Left-Hand Doors.

This holder is similar to a holder now very popular with motorists, but is considerably heavier and is used on extra heavy private garage doors or public garage doors. The working principle of this new holder is based on two very heavy springs covered by a cylinder, protecting them from the weather. These springs act as a cushion, relieving any strain on the hinges when the door is opened.

The new holder is operated by a slight pull of the chain and is reversible for right and left-hand doors.

Steel Lumber Admitted as Fireproof Construction

A NEW ordinance for the City of Cleveland Building Code, passed recently by the city council, admits the use of steel lumber in all types of buildings as fireproof construction.

General Contractors Select Manager

TO co-ordinate the growing varied interests of the Associated General Contractors and to take charge of the development of the broad program adopted at the annual meeting in February, the executive board have created the office of general manager and have appointed Brigadier-General R. C. Marshall, Jr., former chief of the construction division of the army, general manager. General Marshall took office July 1.

He was in charge of all building construction by the War Department of the United States and Insular Possessions, involving an expenditure of more than \$800,000,000 and projects including cantonments, barracks, army supply bases, port terminals, storage depots, warehouses, wharves, docks, roads, hospitals, aviation fields, hangars, proving grounds, embarkation camps, engineers' camps, special camps, gunnery schools, balloon schools, emergency housing, lighters, power plants, factories and shops, munition plants, and special plants for the production of nitrates, phosphorus, T. N. T., and other acids, gas and explosives.

"The Block is Tamped and Carried Away On The Pallet."



The Gooseneck Arm



The Quick Action form

Dependable concrete blocks and concrete bricks can *only* be made by **tamping**. For they *must* be subjected to **pressure** to give them correct **density** and **strength**.

Profitable concrete blocks and concrete bricks must be tamped **quickly, simply, uniformly** and **economically**—with a minimum of time, labor and equipment investment.

THE WATERLOO-PERFECTION TAMPER makes **dependable** concrete blocks and concrete bricks and makes them **profitably**.

Drop us a card today for free literature explaining the wonderful performance of the "gooseneck arms" and the "quick action form." Write today—and remember that we can make **immediate deliveries** on these machines.

Waterloo Construction Machinery Co.

103 Vinton Street

Waterloo, Iowa

OUT ON THE JOB



What Builders Are Finding Good

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Excavating Under Unusual Conditions

DIGGING the basement for a building after five stories had already been constructed was the unusual work done by an excavator and loader for the Walter W. Oeflein Company in connection with the building of the big factories for the Wisconsin Food Products Company at Milwaukee.

This building was started last November in the midst of a prolonged cold snap which left the ground in a solid frozen state, making extensive excavating a physical impossibility. Instead of delaying the construction until the ground became soft enough to dig, the contractors decided to dig only space enough for the footings and columns and leave the bulk of the excavating until a later date. The entire space to be excavated measured approximately 300 by 160 feet and at a depth of about 7 feet.

The location of each column was marked out and a fire built on the spot to soften the ground. A hole was dug just big enough to permit pouring of the columns and the rest of the structure was continued in the usual manner.

The fact that the space between the top of the ground and the bottom of the floor of the first story was less than five feet in some places presented an unusual excavating problem. A steam shovel was impossible because of the low clearance and hand shoveling would have been recklessly inefficient and costly.

The excavator and loader was particularly adapted to the work because of the principle upon which it operates. The dragline which brings the dirt up to the machine requires no more clearance than that required by a man guiding the slip.

The excavator and loader was set at the edge of the building in such a position as to give a straight run between two rows of columns.

At a point, 180 feet away from the machine, two stakes, 20 feet apart, were driven. A heavy chain was stretched between these stakes. Upon this chain two sheaves were hooked, either of which could be unhooked and relocated anywhere on the chain to change the path of the excavation. As shown by Fig. 1, a heavy cable passed from the hoist drum on the machine, then to the digging slip, then thru both sheaves, and back to the retrieving hoist drum on the machine.

As the dirt between one row of columns was removed the



Man Guiding the Digging Slip Under the Building. The Entire Basement Was Excavated After the Building Had Been Constructed.

excavator was moved to the center line of the next row. Only two men were necessary for complete operation—one man at the digging slip and the other operating the machine. Only a limited number of trucks were available, which caused the machine to lose considerable time between loads, but in spite of this condition the dirt was moved at the rate of 30 cubic yards per hour or 300 yards in a 10-hour day.

On the side upon which the machine was located was a depression in the ground running the full length of the side of the building and extending about six feet below the base-

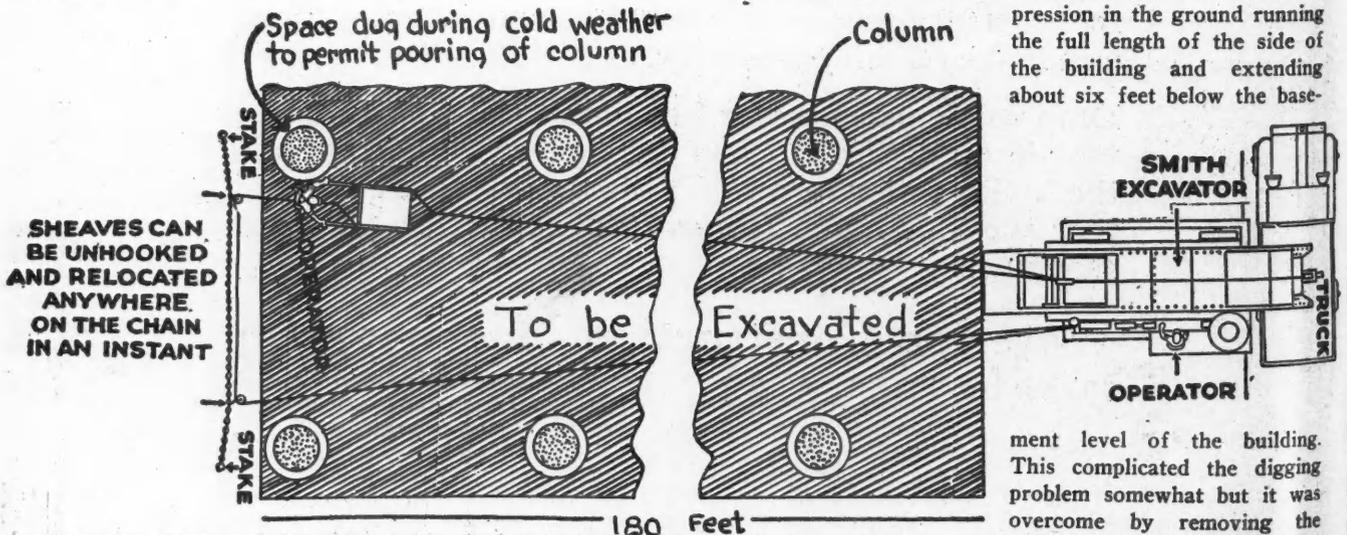


Fig. 1. Diagram Showing Plot to Be Excavated Under Building, Location of Excavator and Loader and Waiting Motor Truck.

ment level of the building. This complicated the digging problem somewhat but it was overcome by removing the wheels of the excavator and building a crib platform upon



ASPHALT
CEMENT

WOOD
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Carey
BOARD

SUPERIOR FOR WALLS AND CEILINGS

There never has been anything quite like Carey Board for basement walls and partitions. It is made of three layers of wood fibre, and unlike any other wallboard, the layers are bound together with Asphalt Cement, to prevent warping.

This Asphalt is the same material used to waterproof the outside of your concrete foundations.

Because it is absolutely water-proof it makes no difference how damp the air is or what happens to the surface of the board, moisture never gets through it.

The asphalt also makes the board an insulator against electricity, and especially sound deadening and heat retaining.

Vermin detest asphalt and will not work through Carey Board. Thus it has advantages for household use no other board possesses.

Used in the natural, creamy color, it gives you a bright, cheerful attic room, warmer in winter, cooler in summer.

It can be applied by *anyone*. No tools needed but a knife to cut it and a hammer to nail it. We give prompt attention to orders for a few sheets or a carload.

Headquarters for the building and insulating products of

ASPHALT **ASBESTOS** MAGNESIA

A Roof for Every Building

THE PHILIP CAREY COMPANY

510-530 Wayne Avenue, Lockland, Cincinnati, O.

50 Branches and Distributors



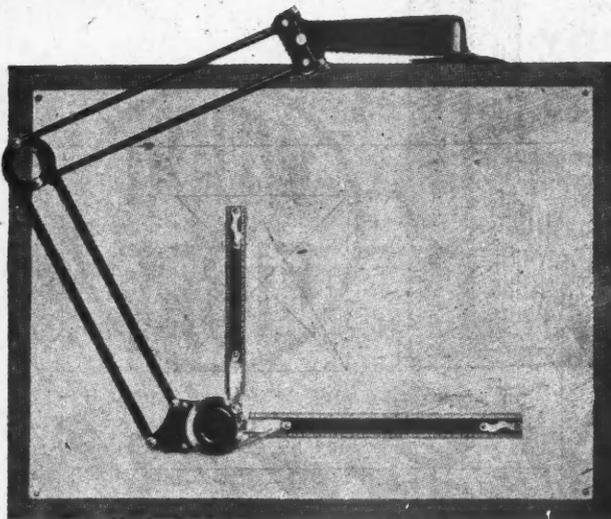
which the machine was elevated and mounted.

This work is most interesting and almost epochal because it opens up new possibilities for making construction work a year 'round proposition. ❀

Time-Saving Drafting Machine

TO draw two measured lines at right angles, the draftsman performs twelve operations. A drafting machine has been devised to perform the same task in two operations.

In the drawing of nearly every line this machine saves the following steps:



Drafting Machine Designed to Eliminate Labor in Drawing Lines.

Placing the drawing edge in alignment, holding the drawing edge in alignment, moving the drawing edge away from the line, picking up the scale, turning the scale to right edge, placing the scale in alignment, laying aside scale and picking up eraser, erasing line where it overruns, brushing away the products of erasing, again placing the drawing edge in alignment, again holding the drawing edge in alignment.

It is estimated that it saves 25 to 50 per cent of the time now involved in this particular kind of work.

The machine consists of tubular rods fastened to the drawing board by means of a corner anchor. These rods are hinged so that they can swing on any angle. On the end of the pair of rods is an engineer's protractor to which are fastened two scale rules. These can be adjusted to the angle desired. This protractor has two independent swinging motions the same as on a transit. It has a double complete swing of the circle, is $4\frac{1}{2}$ inches in diameter, the same as on a small transit and is graduated to $\frac{1}{2}$ degree. The venier reads to minutes. A minute is $\frac{1}{100}$ inch in 36 inches.

Inasmuch as the base of the protractor is rigidly held in alignment, the adjusting is done by holding the hand at the outer end of the long scale. ❀

Sash in This Window Disappear

A WINDOW in which all of the sash disappears in the wall above is attracting the attention of builders thruout the country.

There are also provided fly screens of copper cloth, with solid, rustless metal frames. These screens cover the entire window-opening and can be raised like the sash into the overhead box. They do not have to be removed over the winter. In the autumn the housewife or janitor of the office building simply pushes them up into the cubby provided; in the spring they are pulled down without trouble.

Set in place, these windows resemble closely the ordinary double-hung windows, with the advantages of the familiar double-hung and casement types.

This window permits the use of a very small heating plant and helps to lower fuel costs; while saving time and labor in cleaning and eliminating in the spring at least 85 per cent of screen replacements. Put out in a large series of sizes, it is designed to fit very nearly all forms of construction.

Both sashes fit well into the pocket above the window when the window below is wide open. A rust-resisting iron sheet covers the pocket and acts as a lath for plastering to the ceiling line.

Just below this pocket is the reinforced upper rail of the top screen, placed to form a tight joint with the upper-sash weatherstrip, when both the screens and the sash are lowered. Angle iron reinforcements across frames here insure rigidity; while copper weatherstripping on the bottom rail of the lower sash prevents a like leakage between sash and sill.

The screens are hung in a simple manner, so that they may be disengaged easily for the lowering of the upper screen to the sill, if so desired.

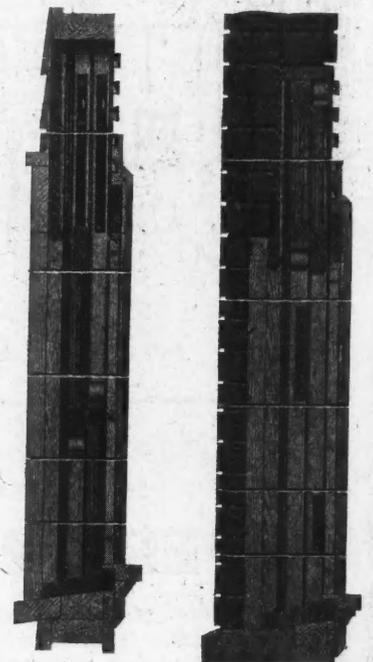
For the lower sash there are copper inner guides. These preserve a correct pressure of both sashes against the spring action of the parting weatherstrip. This parting weatherstrip of copper, in its own turn, cuts off any air leakage at the back of the sash.

The locking plate of the upper sash allows top and center ventilation with the sash securely locked.

The inside trim and the lower sash locking plate allow bottom ventilation, with the sash locked most securely. The frame is made of a selected seasoned yellow pine. Sills are constructed of cypress, kiln dried.

The frame with the pocket is caulked and screwed together solidly, so that racking or springing the frame in either shipping or setting is rendered unlikely.

FELIX KOCH. ❀



Cross - Section View of Window in Frame Wall.

Same Window in Brick Wall.

JUNE building contracts let in eastern Pennsylvania, southern New Jersey, Maryland, Delaware, the District of Columbia, and Virginia, amounted to \$22,507,000, a slight decline from the May figure.

During the first half of the current year building contracts in these states numbered 4,565 and represented a cost of \$198,339,000, as compared with 4,933 contracts let in the first half of 1919 at a cost of \$168,569,000.

Industrial building led in this district during the first six months of this year, amounting to \$59,184,000, or 30 per cent of the total. Other important classes were: Residential, \$56,761,000, or 29 per cent of the total; business buildings, \$32,217,000, or 16 per cent; public works and utilities, \$29,699,000, or 15 per cent.

That building activity has been held up in this district by adverse circumstances is shown by the fact that altho contracts awarded in six months amounted to a little less than \$200,000,000, contemplated work reported in the same period amounted to over \$500,000,000.

ATKINS SILVER STEEL SAWS



Tempering

In the Atkins factory the tempering of *Silver Steel Saws* is not done by craftsmen who pose as "wizards."

It is done by experts who work on information supplied by the laboratory and the latest devices for making accurate physical tests.

For this reason you will find *Atkins Silver Steel Saws* uniformly tough, hence they will cut and do good work for a longer time without refitting than any other saws made.

Send 30 cents coin or stamps; receive in return Carpenter's Nail Apron, Carpenter's Pencil and Time Book.

E.C. ATKINS & CO., Inc.

Established 1857

"The Silver Steel Saw People"

Home Office and Factory, INDIANAPOLIS, INDIANA

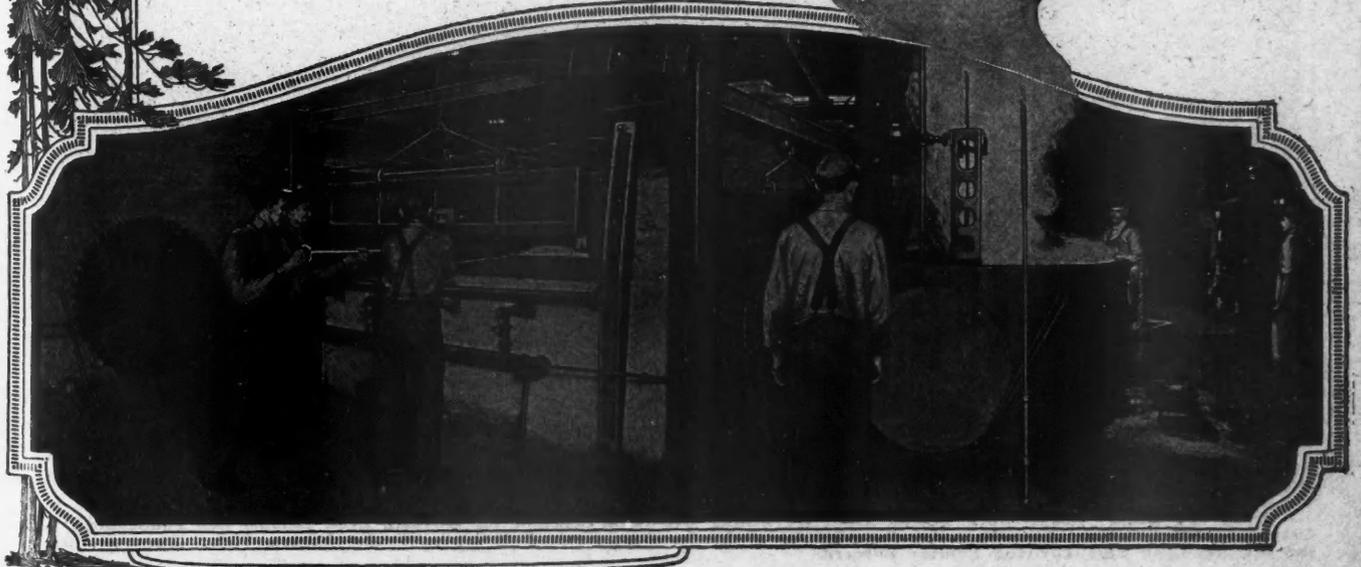
Canadian Factory, Hamilton, Ont.
Machine Knife Factory, Lancaster, N. Y.

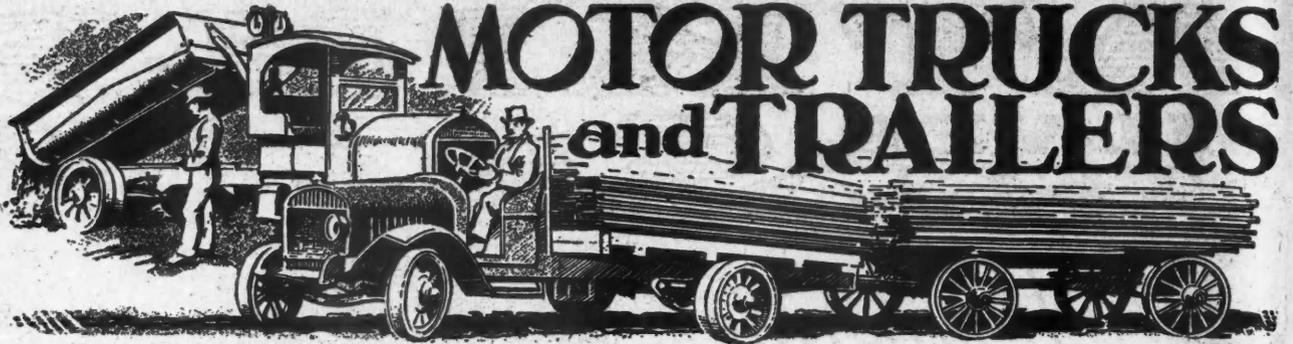
Branches carrying complete stocks in all large distributing centers as follows:

Atlanta
Chicago
Memphis
Minneapolis

New Orleans
New York City
Portland, Ore
San Francisco

Seattle
Paris, France
Sydney, N. S. W.
Vancouver, B. C.





Delivering the Goods

LUMBER AND BUILDING SUPPLY DEALERS FIND MOTOR TRUCK IMPORTANT ASSET IN MAKING QUICK DELIVERIES TO CUSTOMERS

WHILE the entire building business depends to a great extent upon speed, there are two branches of it in which the speed element is tremendously important. These two branches are the building material and lumber dealers. Their big problem is delivery, and delivery on time. Much of their time is spent over the transportation problem but, thanks to the motor truck, they are finding a very efficient solution.

In the first place their transportation facilities must be dependable. Too many men, and too much money depends on their service for them to fail under any conditions. They are called upon to make deliveries under all manner of conditions and their success in business depends on their making good.

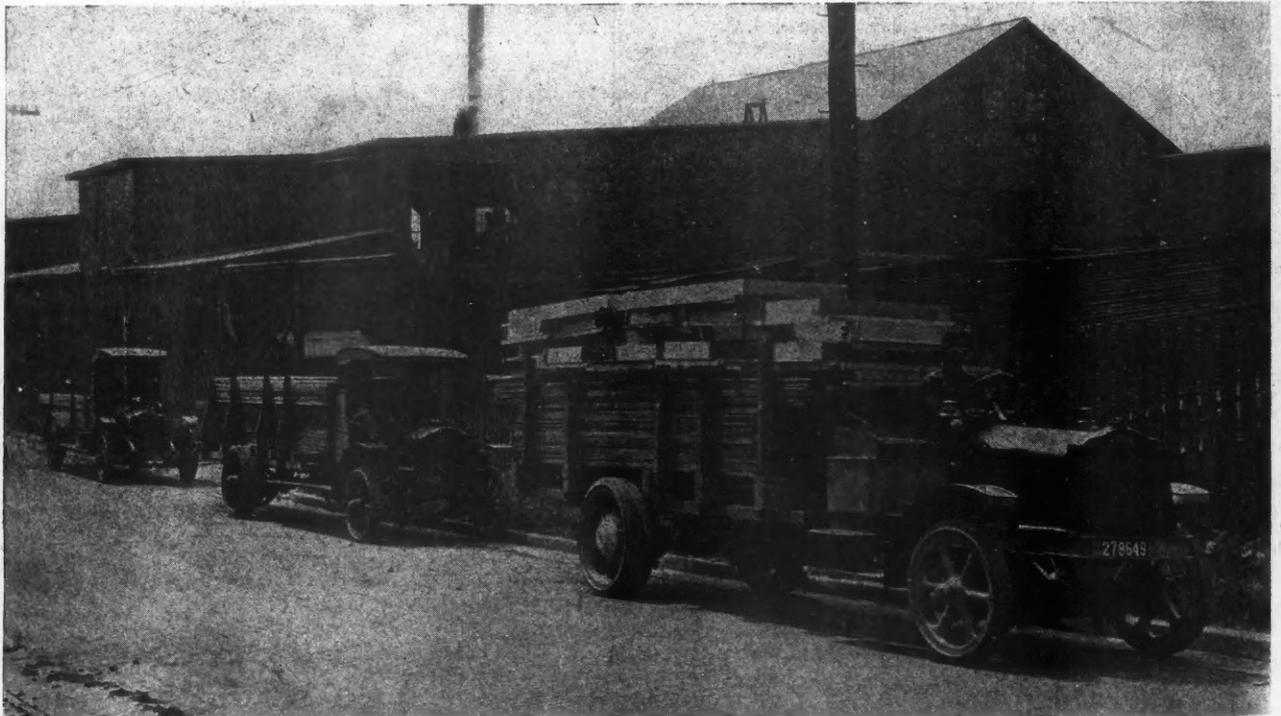
Secondly, they need a medium which will satisfy their need at a reasonable cost. If the transportation bills are excessive, it is obvious they cannot continue in business.

Last, this equipment must possess enduring and staying qualities in order to keep on doing hard work year in and year out.

Lucky for the building material and lumber men the motor truck has come along with all three qualities. It possesses speed, stamina, and is operated at a reasonable cost considering the service it renders. In all kinds of weather, at all hours, it is ready to speed to the job with a big load sometimes 25 to 75 miles away. In many cases the motor truck has been largely instrumental in increasing its owner's business 20 to 30 per cent for the simple reason that he has been able to render satisfaction and service on time.

Service in the pinch counts. The lumber and material dealer know this too well

The stamina of the motor truck under hard work is one of its special features. Submitted to heavy strains, for instance the dropping of a load of stone, sand or gravel from overhead hopper and steam shovels, it



Group of "White" Heavy Duty Trucks That Are Filling Orders on Schedule for Huffman Bros. Lumber Co., Youngstown, Ohio. Despite the Obvious Fact That They Are Carrying Heavy Loads, They Never Fail to Get to the Job on Time. They Are One of the Big Assets in This Thriving Lumber Concern.



*Federal Dump Truck
owned and operated
by C. E. Frye, Okla-
homa City, Oklahoma*

Hard work brings out the best—in trucks as well as men—provided such qualities are inherent.

During the ten years in which the Federals have been built and have been put to a variety of uses, the qualities of durability and dependability have been so apparent that the inner soundness of the truck has never been questioned.



*This is the sign of
the Tenth Year
Federal, a sign sig-
nificant of ten years
of success in every
field of truck trans-
portation.*

In carrying raw materials—heavy loads, dead loads—for individual contractors and large construction companies the rugged ability of Federals to travel through mud and rocky roads, should the occasion demand, has increased their popularity. And this surprising carrying capacity as well as inherent power to overcome transportation obstacles in the every-day working world is accomplished with a surprising economy of operating and upkeep expense.

For every load, for every business,—a Federal is built to suit the demand.

"Traffic News" which tells interestingly the infinite variety of tasks accomplished daily by Federals will be mailed on request

FEDERAL MOTOR TRUCK COMPANY
79 FEDERAL AVENUE DETROIT, MICHIGAN

Another

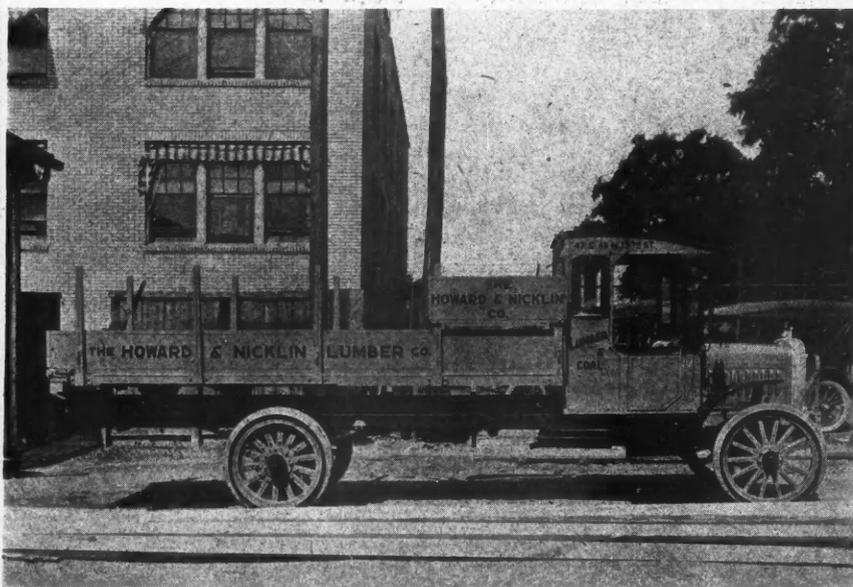
FEDERAL



F. D. Sherrit Lumber Co., Cambridge, Mass., Make a Specialty of Flooring and Sheathing and Naturally During This Busy Building Season Are Going at Top Speed. This 3½-Ton "Selden" Truck, Equipped with a Special Roll Body for Unloading Lumber, Has Been Doing Great Work for Them All Season.

stands up without damage or need of repair. It hauls heavy loads thru bad roads into pits, up inclines to bunkers and bins.

It is important, however, that the dealer give his truck, or fleet if he operates one, some attention and care. Because they are an attractive investment yielding a high return they should not be neglected and there are certain fundamental rules that he should follow in their upkeep. Reckless driving will often cause more damage than rough roads and heavy loads.



Two-Ton "Gram-Bernstein" Truck with Extra Long Wheel Base for Carrying Lumber and Equipped with Lumber Roll-Off Device at Rear of Body. This Truck Is Owned by the Howard & Nicklin Lumber Co., Franklin, Pa.

Builders Supply Company Operates Fleet of Eight Trucks

THE operation of a fleet of eight five-ton trucks has increased the delivery radius served by Murths & Schmohl, builders' supply firm of New York City, to such an extent that a project for the establishment of a branch yard, involving a heavy investment and duplication of equipment, has been abandoned. Instead, the trucks serve to bring the source of supply closer to the user.

The firm first turned to the motor truck in 1911 when they found that deliveries to points eight or ten miles distant from the yards were unprofitable when horses were used. Business expansion demanded a new haulage medium. The firm accordingly retired its 30 horses and discontinued the hiring of the additional teams used during such periods.

A five-ton unit, installed in January, 1912, demonstrated its worth. On its first job, in fact, it delivered five loads of cement daily to a point 10 miles distant from the yard, whereas the horse teams were hauling but one load a day. Furthermore, the truck would haul a 25 per cent greater load.

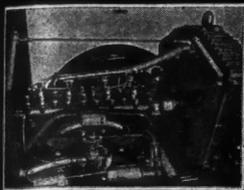
"Until we installed the trucks, we

DUPLEX TRUCKS

BUILT FOR BUSINESS



Patented Spring Suspension prevents damage to Radiator



Motor Meter set in Radiator shell prevents loss by theft

Two Wonderful Runs That Show the Remarkable Stamina and Power of the Duplex Limited

Duplex Limited carrying 3060 pound load from Los Angeles to El Centro via San Diego, 267 miles in 8 hours 26 minutes. Los Angeles to San Diego, 132 miles in 3 hours 49 minutes. San Diego to El Centro, 135 miles in 4 hours 37 minutes. Average speed 34 miles per hour. Entire distance without stop. No relief driver. Rain from Santa Ana to Oceanside. Speed limit observed in all towns in transit.

HERE in this Duplex Limited is the definite practical achievement of the motor truck industry's aim to produce a truck that could freight 1½ to 2 tons at high speed.

This Duplex Limited is no mere city delivery wagon—but a strong rugged road truck capable of hauling 3000 to 5000 pounds over city or country roads, and doing it on schedule time.

Designed and built for pneumatic tires—not merely equipped with them—the Limited travels easily and smoothly enough for even very fragile freight. Minimum vibration and shock saves wear and tear—and adds longer life to the truck.

Its motor is wonderfully rugged and powerful—and when turning over only about 1300 r. p. m. it drives the truck along at 25 miles an hour on high. Gear ratio is 5½ to 1 insuring high speed at minimum wear on motor and other moving parts.

Electrically equipped throughout—which means economy of gasoline as drivers will shut off motor when truck is not running.

The Radiator is suspended in patented Duplex Spring Suspension—which allows ¾ inch sidewise and 1 inch up and down move-



Duplex Limited carrying 3750 pounds of potatoes from New Orleans to Baton Rouge, 124.6 miles in 6 hours 55 minutes running time. Elapsed time 10 hours 10 minutes with 3 hours 15 minutes lost by ferry delays. The motor never missed and the water in radiator boiled only once and that after a 12 mile pull through "gumbo." After a 46 mile run in 2 hours to Port Allen the motor meter registered "warm."

ment before radiator touches anything solid. Prevents damage to radiator solderings and eliminates the great source of radiator leakage.

Lamps equipped with Nitrogen bulbs are mounted on radiator to prevent bulb damage by vibration.

Motor meter made part of radiator shell to prevent loss by theft.

Ball bearings used throughout—engineering tests show it requires 29 times less power to move a given load when ball bearings are used. This means a gasoline saving due to less friction.

Special flapper valve in oil filler pipe keeps sand and grit out of oil reservoir.

From every angle of mechanical value and economical operation this Duplex Limited is a real truck—the very kind you've been looking for in your business.

Have the Duplex dealer demonstrate the Limited. It makes good—and will cut your trucking costs and give reliable service. Write for complete details.

If you have heavy hauling to do—write for booklets about the Duplex 4-Wheel Drive—America's Leading Heavy Duty Truck. "DUPLEX DOINGS"—The Truck Owner's Magazine sent free to all truck users.

Address Dept. 115



Duplex Limited lifted clear of ground by wire around windshield frame. Strength of cowl means safety and less vibration.

Duplex Truck Company

Lansing • Michigan

One of the Oldest and Most Successful Truck Companies in America



For Short Emergency Deliveries, the Thompson Yards, Inc., Lumber Dealers in Lansing, Mich., Find This Light, Speedy "Oldsmobile" Truck Very Efficient. The Pneumatic Tires Are a Valuable Aid in This Work.

were faced with the necessity of establishing at least one branch yard to handle our business," said one of the partners of the firm. "The ability of the trucks made this proposed expenditure unnecessary."

Murtha & Schmohl's oldest truck has traveled more than 96,000 miles; the second unit, installed in April, 1912, has traveled even farther—98,000 miles—having been used on longer hauls some of the time. The third truck, put in service in March, 1913, has passed the 85,000-mile mark. The remaining trucks of the

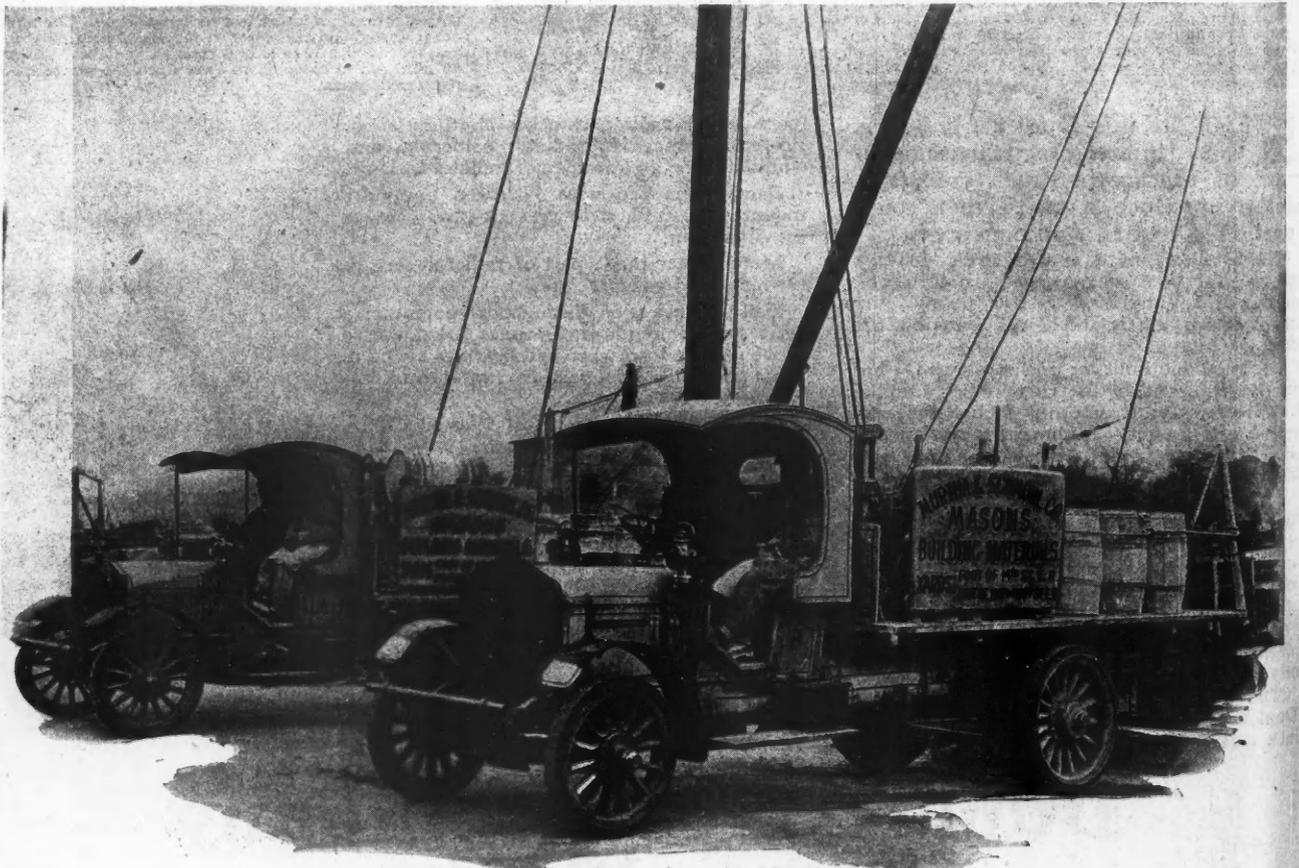
fleet, each purchased in succeeding years, have traveled proportionate distances, each unit registering from 11,000 to 12,000 miles a year.

Brick, lime and cement are carried by the trucks. During the period of war construction they performed notable results in hauling large quantities of materials in rush time. Instead of the normal 1,000-mile-a-month operation, each unit was traveling from 1,300 to 1,400 miles a month during this period.

Some conception of the results accomplished by each unit may be gained from a six-month record, covering the operation from July to December, 1919. This is the

record:

Truck A.	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Miles	813	852	934	1198	882	815	5494
Tonnage	435	455	485	655	555	515	3100
Days worked.	22	26	25	27	24	24	148
Average miles per day.....							37.1
Average tons per day.....							20.9
Truck B.	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Miles	839	736	802	1188	882	1105	5462
Tonnage	465	485	435	665	550	575	3175
Days worked.	24	26	22	27	24	26	149
Average miles per day.....							37.1
Average tons per day.....							21.3



Two Units of the Fleet of "Pierce-Arrows" Operated by the Murtha & Schmohl Co., New York City, Dealers in Building Materials of All Kinds. They Have a Truck Which Has Covered 96,000 Miles and Is Still Going Strong. It Started Work in 1912. Another "Pierce-Arrow" Has Covered 98,000 Miles.



Hall Trucks are the development of forty-six years experience in the fabricating and transportation of structural steel

Combining Strength With Economy

HALL users will tell that strength and economy are two characteristic features of Hall Trucks.

Bear in mind, too, that Hall excess strength is achieved without excess weight.

From an engineering standpoint Hall Trucks embody the approved principles of design and construction.

From the users' standpoint of practical service they represent wonderfully efficient trucking units that work at lowest costs.

Hall Trucks come in a complete line of sizes and models—there is one that will exactly fit your needs.

Write us direct for details. Address Dept. 13.

LEWIS-HALL MOTORS CORPORATION
DETROIT, MICHIGAN
Formerly Motor Truck Division of the Lewis-Hall Iron Works



2½, 3½, 5 and 5 to 7 Ton Models, any type of body

HALL TRUCKS



Excavating Work Is the Acid Test of a Motor Truck. This 5-Ton "Diamond T" Owned by Richard E. Myers, Contractor, Has Been Making the Grade Without Trouble. It Carries a Heavy Load Every Time It Leaves the Job.

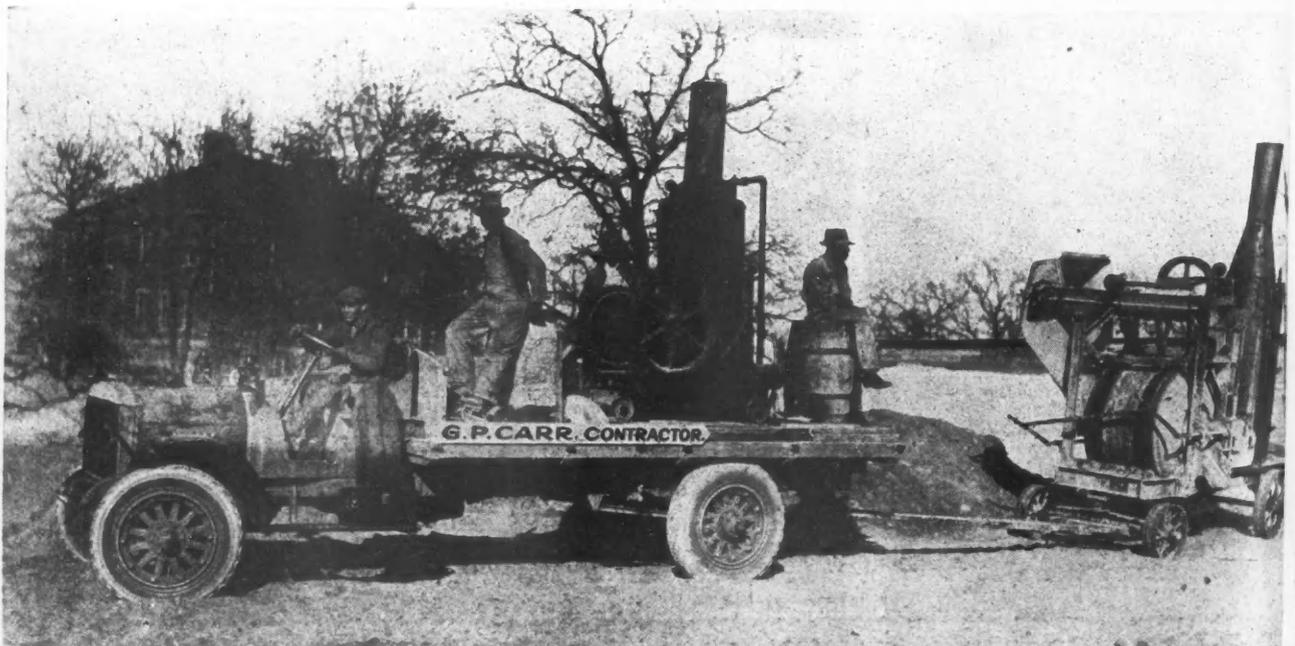
Truck C.	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Miles	942	829	890	854	751	905	5171
Tonnage	635	425	565	690	549	655	3509
Days worked	26	26	25	25	23	26	151
Average miles per day	34.2						
Average tons per day	23.2						
Truck D.	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Miles	654	870	986	1151	1017	1048	5723
Tonnage	440	590	790	680	615	695	3810
Days worked	17	26	25	27	24	26	145
Average miles per day	39.4						
Average tons per day	26.2						
Truck E.	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Miles	1063	829	1048	1074	900	995	5909
Tonnage	675	540	760	775	610	775	4135
Days worked	26	25	25	27	24	26	153
Average miles per day	38.5						
Average tons per day	27						
Truck F.	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Miles	956	828	1024	898	911	878	5490
Tonnage	615	555	700	665	670	670	3875
Days worked	26	26	25	23	24	26	150
Average miles per day	36.6						
Average tons per day	25.8						

Truck G.	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Miles	983	854	935	953	823	874	5422
Tonnage	575	550	690	740	650	640	3845
Days worked	26	26	25	27	24	25	153
Average miles per day	35.4						
Average tons per day	25.1						

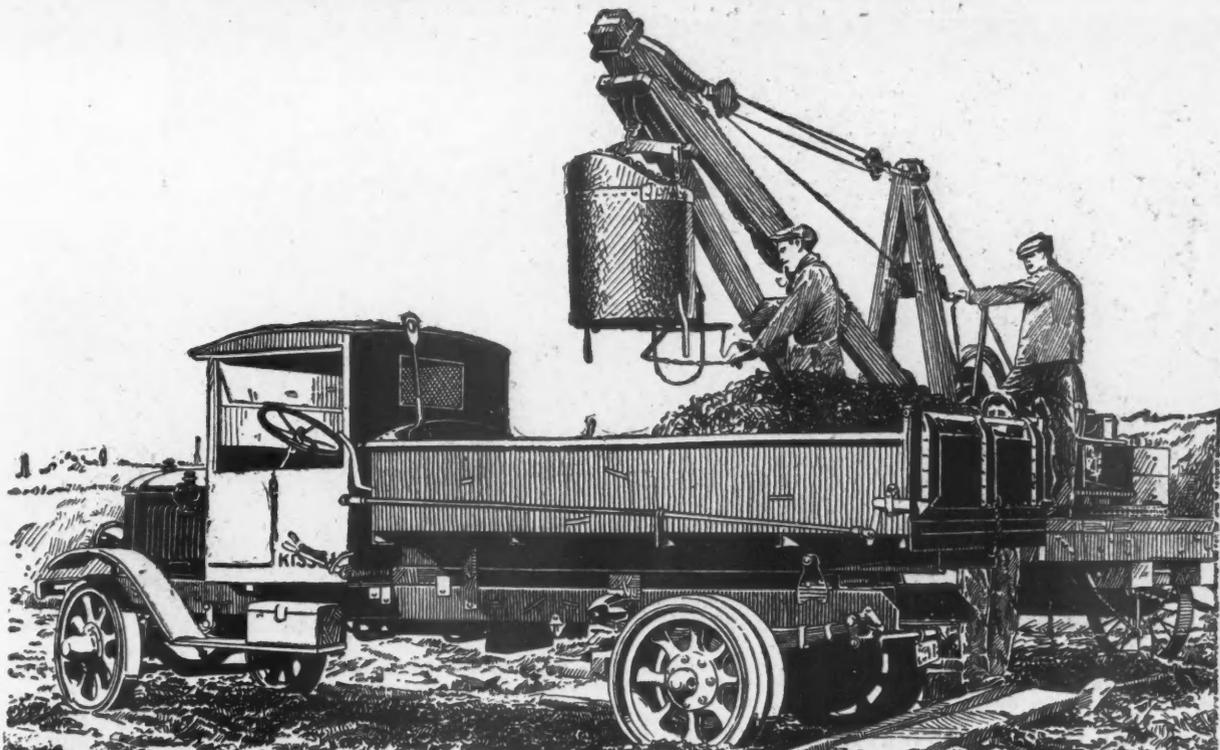
A TRUCK well painted should be washed regularly. A dirty looking truck is a poor advertisement for any business firm. The washing should be done systematically and not left to the next heavy rain storm, as is usually the case with the average owner. One of the best investments the owner can make is a wash-rack. After it has been installed the driver should be instructed to use it regularly according to a schedule arranged so as to give the driver ample time to do the work properly.



Down in St. Louis the Julius Seidel Lumber Co. Has Been Building Up a Reputation and Successful Business by Delivering Lumber on Time Regardless of Distance. The Combination "GMC" Truck and Trailer Shown Above Is One of the Reasons.



Moving Machinery and Equipment to the Job. This Important Work Is Being Done Very Efficiently and Speedily by the "Federal" Truck Owned by G. P. Carr, Contractor, at Norfolk, Va. Note the Penumatic Tires.



K ISSEL Truck performance *plus* for contractors, excavators, engineers, road builders, etc., is due to the Kissel-built motor, designed, perfected and manufactured by Kissel for truck purposes only.

A correspondingly high degree of dependability is built into the brakes—the heavy, flexible springs of specially selected steel—the pressed steel frame, sturdy to withstand overloads.

It is this practice of making each unit a little stronger and more wear-resisting than necessary that keeps Kissel Trucks on the job day in and day out—year in and year out.

Four models give a size for every contracting equipment. Our truck advisory service, insuring the right sized model for every contractor is at your service.

Get in touch with the nearest Kissel distributor transportation engineer—located in all principal cities.

Kissel Motor Car Co., Hartford, Wis., U. S. A.

Originators of the ALL-YEAR Truck Cab

KISSEL TRUCKS

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER



The Rowe Contracting Co., Boston, Mass., is a busy firm and for that reason maintain a fleet of 5-Ton "Packards" like the pair shown above. These trucks have just been filled up from hoppers and are starting out to the job which is quite a distance away. The dump bodies make unloading a matter of minutes.

Helpful Hints for Warm Weather

NOW that the warm weather is here a few suggestions for the truck owner will be in order. First, in regard to the cooling system. Do not expect the truck to labor in low gear up long grades or thru sand, perhaps with a trailer, and still keep cool if carbon deposit is permitted to accumulate in the cylinders, if insufficient water is put in the radiator, or if the oil level is low or the oil is of the wrong kind.

With the coming of warm weather it is ordinarily necessary to change the carburetor adjustment, that in summer being a trifle leaner than that for winter. Overheating is sure to result if the carburetor is improperly adjusted. Carburetor adjustments should not be made except by competent mechanics. Try no experiments.

Timing has an important bearing on cooling. The magneto contacts and brushes should be examined and the spark advanced as far as possible without producing a knock. However, allow no amateurs to experiment on the magneto. A weak spark has the same effect as a late spark, and overheating will result.

Difficult grades can be made with greater speed and less fuel in intermediate than if the engine is permitted to labor in high to the point of stalling. Contrary to popular supposition the engine will cool better if it is not obliged to labor excessively.

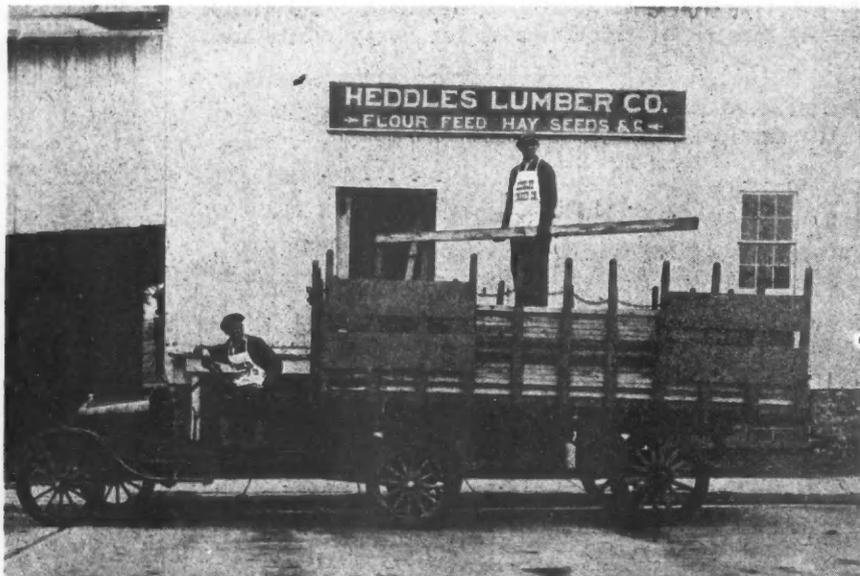


Jack-Knife Trailer in Lumber Yard

THE four-wheeled trailer has one inherent advantage in being a complete vehicle which can be moved from place to place or left standing without the use of any additional equipment. When the loads are so large as to make it impossible to carry them on a semi-trailer unless equipped with metal tires, the use of a four-wheeled trailer helps to solve the lumber dealer's problem.

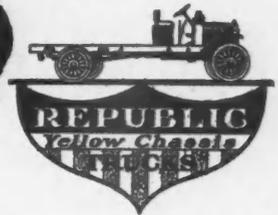
The four-wheeled trailer of light capacity can be hauled in emergency behind the light salesman's passenger cars generally employed by the large lumber companies.

By building up the support of the fifth-wheel on the rear deck of the tractor frame, the framework of the two-wheeled semi-trailer is usually slanted toward the rear and helps to provide a more rapid unloading of the lumber than in the case with the four-wheeled trailer with a horizontal frame.



Making a 1-Ton Ford Pull a 3-Ton Load by Using a "Highway" Trailer. Hauling Costs Were Cut 66 2-3 Per Cent by the Heddles Lumber Co., Edgerton, Wis., Owner and Operator of Thirty Lumber Yards Throughout the Country.

REPUBLIC TRUCKS

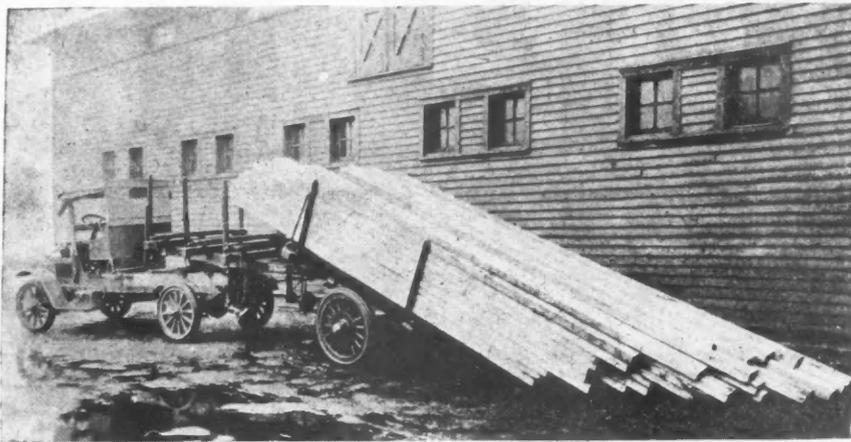


Republic policy of Service to the Owner is founded on the conviction that Service is the truck owner's most vital requirement. Two thousand Service Stations cover the country, backed by seven National Parts Depots, making Republic Service definite, and assuring Republic owners everywhere uninterrupted performance.

Capacities: 1, 1½, 2½, 3½ Tons

Republic Truck Sales Corporation, 953 Michigan Ave., Alma, Michigan

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER



Jack-Knife "Trailmobile" Just as the Load of Lumber Has Been Rolled Past the Center of Gravity and Is Tipped Off.

This condition has been overcome, however, in most cases by mounting the rollers on the four-wheeled trailer on a special built-up framework, so that the forward roller is several inches higher than the one at the extreme rear.

While this practice assisted in unloading lumber more readily the Gates Lumber Company of New York City is using a new type of four-wheeled trailer from which the lumber may be unloaded even more rapidly.

This new type of trailer has what is termed a jack-knife frame. It is really two frames in one. The regular framework is attached to the rear axle in the usual manner, but is not attached to the front axle. Instead, a shorter framework attached to the front axle has its two side members pivoted to the side members of the main frame a short distance ahead of the transverse center line of the main frame. When lumber is placed upon the trailer the main frame holds down upon the secondary frame attached to the front axle and rests directly upon it. As shown in the illustration, the main trailer frame has four crosswise rollers mounted directly. These rollers are all at the same level.

To unload the trailer, the lumber is rolled backwards by means of a ratchet device on the roller until the

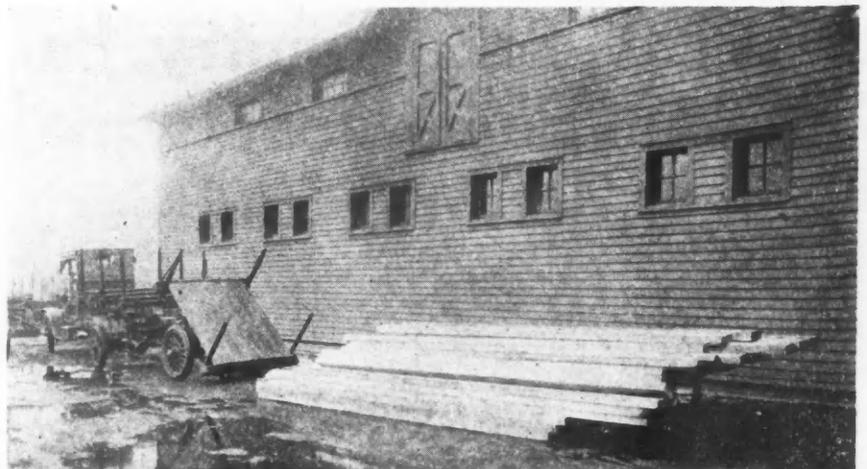
This new type of trailer marks a big advancement in the use of such vehicles in the lumber industry and is worthy of full investigation by other lumber concerns which have discarded wagons in favor of the more modern truck equipment.

When four-wheeled trailers are employed, it is customary to carry a portion of the load on the pulling vehicle in order to secure sufficient traction for the driving wheels. In cases such as that of the Gates company, where small Ford 1-ton

trucks are employed, the comparatively small body on the Ford may be utilized to carry bundles of shingles. The use of trailers also permits the lumber dealer to more adequately solve his peak load problems.



Second Stage in Operation. The "Trailmobile" Has Opened Up Like a Jack Knife While the Load Is Nearing the Ground.



The Job Is Done. Only a Few Minutes Are Required to Unload Lumber with This Trailer Device. Church E. Gates, Lumber Dealers in New York City, Use the "Trailmobile" in Their Yards.

center of gravity of the load is slightly past the rear trailer axle. The end of the main frame, thus relieved of its load, swings upward about the rear axle, so that the rear end of the trailer frame is nearer the ground than when the framework is horizontal. The frame opens like a jack-knife. As the tractor is moved forward, the load is slid off so that there is only a drop of a few inches from the front end of the lumber onto the ground. This is very desirable, as it permits the entire load to be deposited in one pile without scattering.



General Motors Trucks

Conserve Time With GMC Trucks

CONTRACTORS must figure the time element closely, for work delayed means money lost.

Getting materials to the job when needed is most important if time is to be saved.

Reason enough why contractors the country over have added GMC Trucks to their equipment, for they know they can

depend on GMC Trucks for continuous operation and at a minimum expense.

The best of materials are used by skilled workmen in building these trucks—and GMC Trucks are *built* in the GMC factory, not just assembled.

Contractors using GMC Trucks can figure time closely for these trucks are thoroughly dependable.

GENERAL MOTORS TRUCK COMPANY
PONTIAC, MICHIGAN, U. S. A.

Branches and Distributors in Principal Cities

(677)



WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER



Lesson in Plan Reading

FREE!

Send now for this FREE lesson which we will send to prove how quickly you can learn Plan Reading by our new, easy method. Not a penny to pay for this lesson. Just ask for it. Without a good knowledge of plans your opportunities are limited. At work you don't get the chance to study blue prints or to have their meaning explained. We make the chance for you. We place in your hands plans used in actual construction by contractors in Chicago and other cities, and you get lessons by men in charge of building work who will help you at every step and make you an expert plan reader.

Builders' Course On Easy Payments

Our Builders' Course gets right down to the things you need to know. And you can get it on easy payments. A small first payment when you enroll—then payments monthly—so small you will never feel the cost. At least write and find out what this course really offers and how you can make more money by learning what we will teach you in a short time.

Learn By Mail

Use your spare time at home to learn how to be a better workman, a better foreman or a better contractor. Even after you complete the course you have the privilege of consulting us when you want suggestions. We will always be ready to help you.

Some Things We Teach

Plan Reading Use and meaning of all the lines. Plans and elevations. Reading dimensions. Detail Drawings. Laying out work from plans. Practice in reading plans from basement to roof, etc., etc.

Construction Brick work, stone work, carpentry, plans and specifications. Every detail explained for residences, office buildings, factory buildings, etc., etc.

Estimating Figures on every kind of building work fully explained. Labor and material. Problems worked out from plans. Practical builders' methods studied from plans and specifications of actual building of every kind.

Arithmetic A complete course arranged especially for builders and contractors.

Architectural Drafting Also other branches of drafting. Send for special catalog on these courses.

Send the Coupon

Get this information now. Learn how to make more out of your work or out of your business by knowing more about it. All this information is free. Send for Free Lesson and this information—now. Just send request on the coupon below.

Chicago Technical College

836 Chicago "Tech" Building Chicago, Illinois

Without obligation on my part, send me the Free Lesson in Plan Reading, also information on your Builders' Course in Plan Reading, Estimating, etc.

Name.....

Street.....

City.....State.....

Present Occupation.....



NEWS OF THE FIELD

Gorham Company Opens Chicago Office

IN order to handle their increasing Western business, the Gorham Co., New York City, architectural bronze manufacturers, have opened an office in Chicago. It is intended particularly for the service of builders in this section.



Southern Pine Association Issues Revised Manual

A REVISED and enlarged edition of the Southern Pine Manual of Standard Wood Construction will shortly be published by the Southern Pine Association for distribution to architects and engineers thruout the country.

New material incorporated in the manual includes a number of additional tables and formulas. Among these tables are some taken from the Carnegie Steel Company's handbook; also Hodgman's surveyors' tables. The association also has purchased all rights for publication in this and succeeding editions of the manual of Mr. Benjamin E. Winslow's article on "Short Cuts in the Design of Roof Tree Houses."

In order to take care of the needs of those already having copies of the old manual the association will publish a supplement containing the additional matter embraced in the new manual and send copies of the supplement to all such persons. Plans call for printing of 10,000 copies.



New Universal Products Sales Manager

MR. E. T. USTICK, JR., formerly with the Blue Bird Washing Machine Company, of St. Louis, has taken over the distribution of Universal Products lighting plants manufactured by the Universal Products Company of Sandusky, Ohio, and Oshkosh, Wis., with offices in St. Louis, Mo.

Mr. Ustick has associated with him Mr. Wm. Attebury, distributor for Missouri territory tributary to St. Louis and the Southern portion of Illinois.



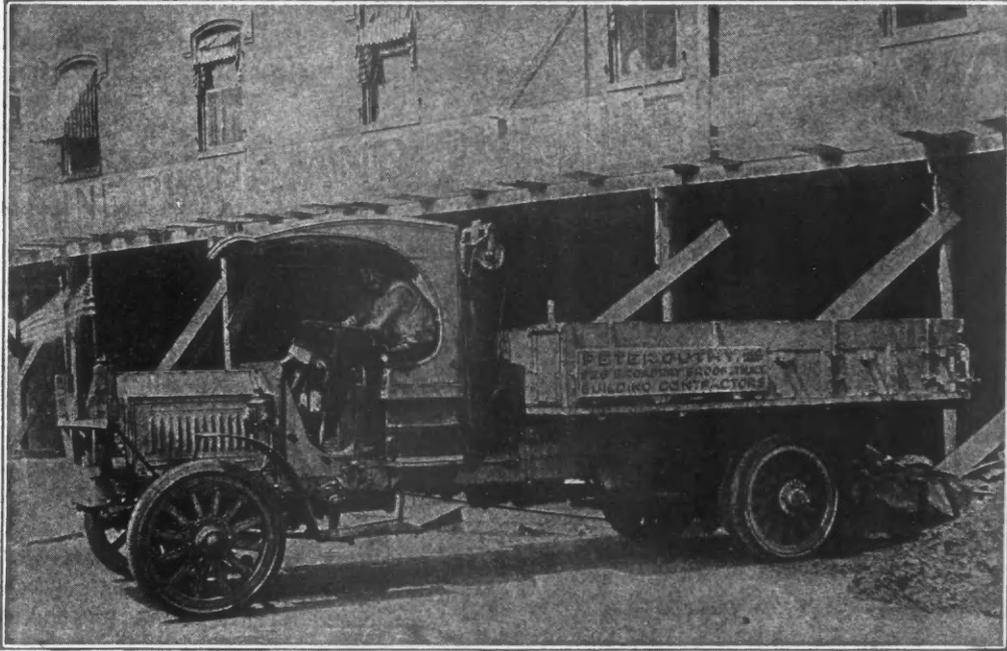
American Cement Plaster Company Joins Beaver Board

THE American Cement Plaster Company, of Lawrence, Kan., producers of gypsum and gypsum products, has been consolidated with the Beaver Board Companies, of Buffalo, N. Y., manufacturers of the well-known Beaver Board.

The American Cement Plaster Company have large gypsum deposits and mills located at all the principal gypsum producing points east of the Rocky Mountains, and their merger with Beaver Board brings them strong financial support to further their immediate plans of expansion.

Their production is to be enlarged by additions to their present mills and by the construction of new ones at advantageous points. Part of their output will also be diverted to the Beaver Board companies, and will help the latter to enlarge and improve their service to the trade.

Mr. J. A. Henley, president of the American Cement Plaster Company, plans to retire within a few months. Mr. W. E.



Packard equipped with hoist for general contracting work. The ability of a Packard to climb a 28% grade makes it especially useful to the Contractor who has excavation work to handle.

Is the Truck Owner Getting the Benefits of Regular Maintenance Service

THE wear and tear of the Contractor's rough work, convinced him long ago of the basic economy of regular, expert maintenance for his trucks.

That is why he asks, before he buys a truck today, "What sort of maintenance organization will you put behind my truck?"

In more than 200 Packard Service Stations you find Uniform Service Methods, Uniform Stock-keeping Methods—a uniform system in place of the haphazard, time-consuming practice found in the average repair shop.

You find more than one hundred repair operations standardized—workmanship improved, time saved, costs reduced.

Cooperation between owner and Packard Service is carried out by a system of monthly truck inspections whereby more efficient operation and low maintenance are assured.

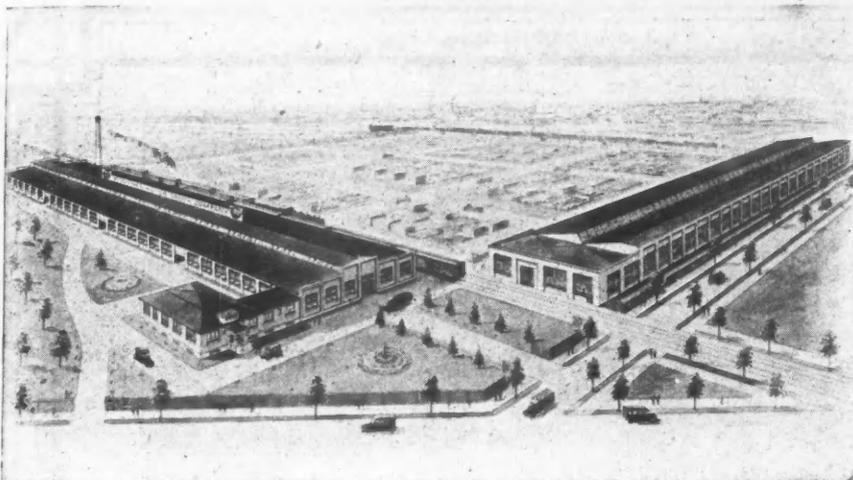
The Packard Technical Service Division was established to give the fullest advantage of Packard's 44 factors of engineering superiority, and the long life built into every Packard Truck.

And the Truck User who is anxious to put his hauling system on a solid economical foundation—will quickly see the advantage of such expert continued maintenance in reducing his hauling costs.

We have prepared an interesting booklet on motor-hauling for the Contractor. Sent by nearest Packard Distributor on request.

Ask the Man Who Owns One"

PACKARD MOTOR CAR COMPANY, Detroit



New Plant to Be Built by Winther Motor Truck Co. at Kenosha, Wis. It Will Be 60 Feet Wide and 400 Feet Long.

Shearer has been elected vice-president and general manager and will act as managing executive of the company. Mr. Shearer has for years been general sales manager for the American Cement Plaster Company. Mr. Warren Henley succeeds him in that capacity.



Winther Starts New Building

The Winther Motor Truck Company, of Kenosha, Wis., has broken ground for a large addition to its present plant and it is anticipated that the new building will be completed and ready for occupancy by August 30th.

The new structure is 60 feet wide by 400 feet long and will be of modern saw-tooth construction, with concrete floors,

brick walls, and a wide skylight extending the entire length of the building. No labor saving device or safety appliances have been overlooked in equipping this new addition, the entire plant being laid out for high speed production.

The new plant lines within a few feet of the Chicago-Northwestern Railroad, and spur tracks pass between the two buildings with ready access to receiving and loading platforms.

Chassis construction will still be carried on in the present plant, and the new building will be used only for final assembly, painting and inspection of Winther trucks and the Winther Six, the new passenger car.

National Pressed Steel Opens Baltimore Office

The National Pressed Steel Co., Massillon, Ohio, has opened new district offices at Baltimore, Md. Mr. Beverly W. Blake will be district representative.



Goodyear Opens Plant in Los Angeles

THE Goodyear Tire and Rubber Company of California began operations in their new \$20,000,000 factory at Los Angeles recently.

The first tire turned out of the plant was built by P. W. Litchfield, vice-president and factory manager of the Ohio company, who made the long trip west for that purpose. Other officials of both Akron and California companies aided in the manufacture of the first pneumatic.



At present, particularly, it is important for you to know that no other plastering base, for exterior and interior, is so economical as *E-Cod Fabric*. Lower than any other durable base in first cost and available for immediate shipment, it saves in every plastering operation. *E-Cod Fabric* saves from 40% to 60% of the scratch coat required on any ordinary open mesh lath to form the key. Plaster can be applied faster, saving heavily in expensive labor—time. For real economy in building use *E-Cod Fabric*. Full particulars and samples on application.

MacADAMS & CALL
Conway Building
CHICAGO

THE ROMORT AIR & WATER STATION

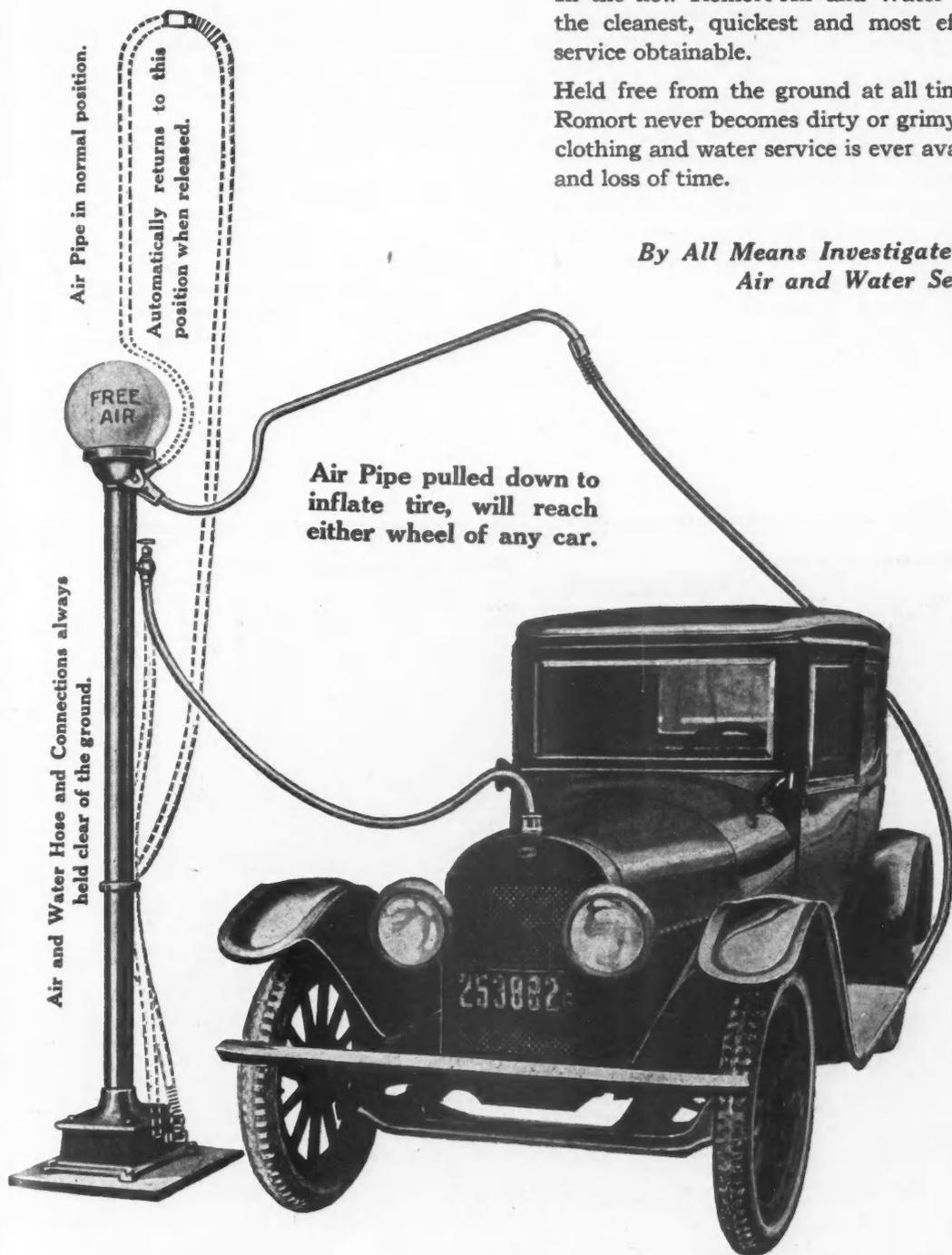
To The Man Who Is Planning A Filling Station

Don't overlook the essentiality of an "Up to the Minute" Tire Air and Radiator Water Service.

In the new Romort Air and Water Station, you will find the cleanest, quickest and most efficient air and water service obtainable.

Held free from the ground at all times, the air hose of the Romort never becomes dirty or grimy to soil the hands and clothing and water service is ever available without trouble and loss of time.

*By All Means Investigate the Romort
Air and Water Service*



Air Pipe in normal position.

Automatically returns to this position when released.

Air Pipe pulled down to inflate tire, will reach either wheel of any car.

Air and Water Hose and Connections always held clear of the ground.

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The Romort Mfg. Co.
OAKFIELD, WIS.

Write Us Today for Full Details

SALES DEPT.
The Zinke Co.
1323 MICHIGAN AVE.
CHICAGO ILLINOIS

The California company begins operation with 2,000 employes, of whom 700 are in the offices and 1,300 in the factory. One-half of the factory employes are experienced tire builders sent from Akron to train the 7,000 men who will ultimately be employed.

The new company has erected many bungalows for its workers, financing them in the same manner that has enabled 15,000 Akron employes to enjoy comfortable homes.

Meadows Company Dedicate New Plant at Bloomington

A UNIQUE and interesting ceremony took place in the new plant of the Meadows Manufacturing Company, at Bloomington, Ill., on July 6, when the plant was dedicated with prayer. The Reverend I. W. Longenbaugh made the dedication, and in his prayer affirmed that a business enterprise with the Almighty as its partner, is bound to succeed.

Mr. John Rocke, president and manager of the Meadows Manufacturing Company, spoke of the growth of his great industry from the time when he made his first grain elevator on his farm at Meadows, Ill., thru the years until the present day marking the completion of one of the most modern industrial plants in the United States.

He spoke of the ideals of uprightness, honesty and earnest endeavor which have done more than anything else to build up the Meadows reputation.

Mr. H. Hudson, secretary of the Bloomington Chamber of Commerce, officially welcomed the Meadows Manufacturing Company to Bloomington, predicting success for the industry, and happiness and content for its corps of workers.

The Meadows Manufacturing Company, at their new plant will manufacture the same lines as before, but with greatly increased production possibilities. These lines are—the Meadows grain elevators, Meadows power washing machines,

Meadows pitless farm scales and Meadows gamble binder hitches.

Bestwall Consolidates with Beaver Board

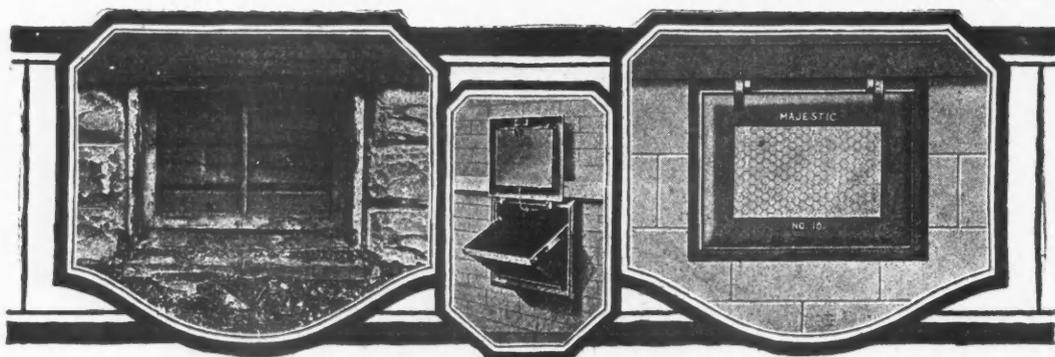
THE Bestwall Manufacturing Company, manufacturers of Bestwall, with plants located at Akron, N. Y., and Grand Rapids, Mich., have consolidated with the Beaver Board Companies, of Buffalo, N. Y., and the American Cement Plaster Company, of Chicago, Ill., and Lawrence, Kan.

The new amalgamation places the extensive gypsum mines of the American Cement Plaster Company, with estimated deposits of between 25,000,000 and 30,000,000 tons, at the disposal of the Bestwall people, and thus insures them an unlimited supply of raw material.

Their association with Beaver Board not only gives Bestwall the assurance of an unlimited supply of fibre liner, but also gives them the advantage of the extensive resources of the Beaver Board companies and enables them to carry out immediate plans for expansion. Manufacturing facilities are already being rapidly increased and by January 1 Bestwall will have a much larger production and a considerably wider distribution.

Arrangements are being made to improve Bestwall service to the trade in every way. The increased production will not only make possible better deliveries but lower manufacturing costs. Their new plants, when completed, will enable them to ship orders from convenient points and reduce freight charges. As a result, it is felt that Bestwall in the future will be an even more advantageous and profitable line for dealers to handle than in the past.

At present the Bestwall mills are far behind orders, and the first effort will be to speed up production in every way possible. No change is contemplated in the management of the company and the Bestwall offices will continue to serve the trade as in the past.



Your Coal Window— Liability or Asset?

The coal-bin window in *your* house—is it a noticeable blemish or a permanent asset?

An ordinary frame and sash window, like the upper reproduction of an unretouched photograph, is a liability. The damaged walls and foundation lessen the value of your property. Each delivery of coal increases the depreciation. Necessary repairs are costly—and they never end.

The Majestic Coal Chute protects property—increases its value. It is a real asset. Buyers, tenants, home owners realize this. That is why so many new houses, as well as old ones, are being Majestic-equipped.

Take advantage of this protection. If you are building specify a Majestic Coal Chute. Have one installed in your present home. There is a style and size for every building. Working drawings gladly supplied. Write for our catalog which gives complete specifications of all types of Majestic Coal Chutes, and shows also Majestic Underground and Built-in Garbage Receivers, and the Majestic Milk and Package Receiver.

The Majestic Company

1602 Erie Street

Huntington, Indiana

Majestic COAL CHUTE

1. Protects Against Damage
2. Enhances Property Value
3. Lessens Depreciation
4. Saves Money

TWO BIRDS



With Willis Hog-House Windows & Ventilators

You Make A Double Profit
 One for the **BUILDER**
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START the ball rolling. Knock down some of the profits that can be had by using Willis Products on your jobs. Farmers will be perfectly satisfied with our hog-house windows and ventilators because they are constructed on scientific lines to insure healthier stock and incidently more profits for the farmers.

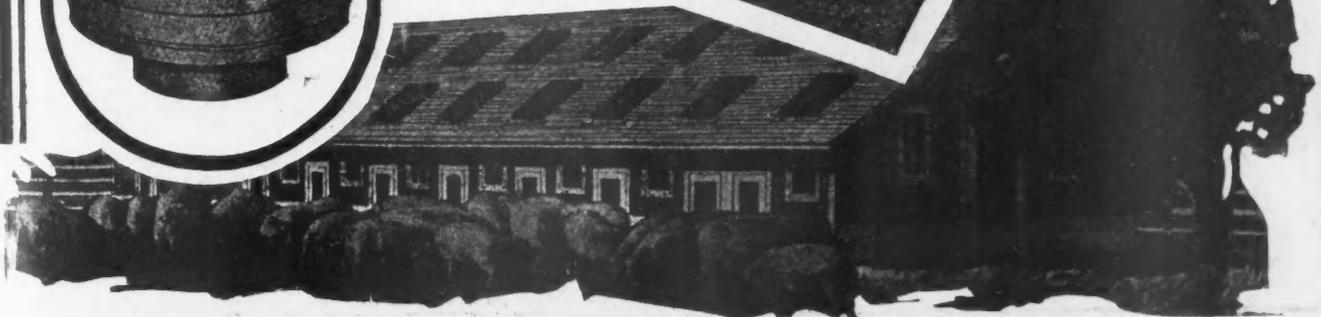
All Willis Products are backed by our years of experience in manufacturing sheet metal products. We know what the Builder and Farmer want and have made it our business to produce it. The result is a line of building equipment of the highest standards at a reasonable price. Every article is strongly built of the best materials, and carefully finished; planned with judicious forethought as to the most efficient use; yet perfectly simple and easy to install.

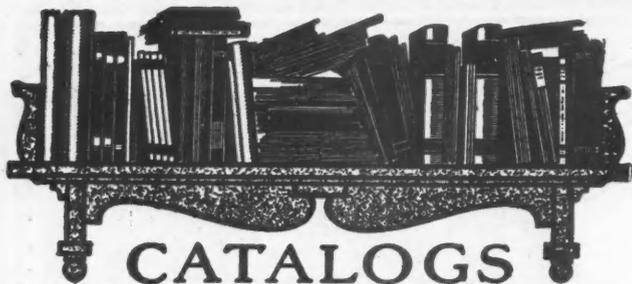
Both you and your customer will profit by the use of Willis Products—satisfaction all around is the result.

Write for catalogue illustrating complete line of Willis Products.

Willis Manufacturing Co.

GALESBURG,
 ILLINOIS





CATALOGS BULLETINS & BOOKS RECEIVED

The following literature, dealing with subjects of interest to builders is now being distributed.

"Drafting Room Furniture" is the title of a booklet recently issued by C. F. Pease Co., Chicago, Ill. It contains illustrations and descriptions of steel filing cabinets for blue-prints, specifications, etc., drawing tables, stools, and mechanical drawing instruments. A supplementary pamphlet describes a new motor driven eraser manufactured by that concern.

"Louden Barn Plans" have been incorporated in a new book issued by the Louden Machinery Co., Fairfield, Iowa. It is an extensive compilation of barn plans and photographs prepared by the architectural department of the Louden company, and is designed to aid the modern farmer in planning and equipping his farm building. Some space is devoted to stall equipment and carriers.

"How to Use Briklath" is the subject of a new booklet published by the Composite Metal Lath Co., Chicago, Ill. This forty-page cover booklet contains specifications and drawings showing the application of Briklath, the metal

lath manufactured by that company. It also contains several pages on stucco and plaster finish.

"Industrial Housing," as an important factor in stimulating factory production, is the leading article in the current issue of "General Fireproofing," the monthly magazine issued by the General Fireproofing Co., Youngstown, Ohio. It was written by Emile G. Perrot, C. E. Other articles on duplex houses, fireproof house construction are also included in this number.

"Clothes Dryers and Laundry Equipments" are listed in detail in the new catalog issued by the Chicago Dryer Co., Chicago, Ill. Laundry appliances suitable for residences and apartment buildings, small and medium sized hotels, and hospitals are described and illustrated, also electric washing and ironing machines.

"Truscon Floretype Construction" is the subject of a sixteen-page pamphlet issued by the Truscon Steel Co., Youngstown, Ohio. It is a very complete explanation, well illustrated of the two types of floor construction, "Floretype and Floredome," manufactured by the Truscon company.

"Test Data on Lime in Concrete and Mortar" is the title of Bulletin 303, issued by the National Lime Association, Washington, D. C. It is an extensive report on the use of hydrated lime in concrete construction prepared by Tyrrell B. Shertzer. It contains several tables of results of tension and compression tests.

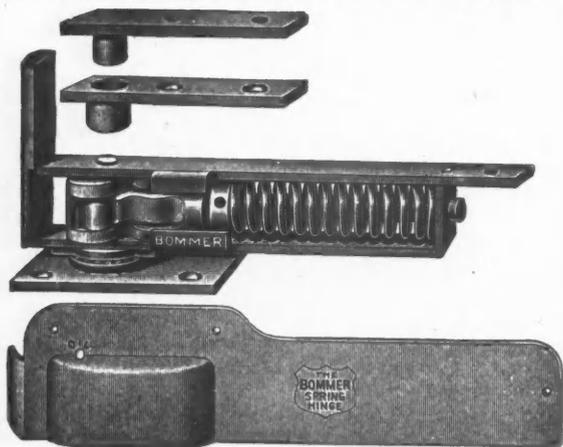
"Standardization in Building Construction" is the leading editorial in "Concrete in Architecture and Engineering," published bi-monthly by the Portland Cement Association, Chicago, Ill. The magazine also contains several other interesting articles and pictures of concrete work in many different lines of building construction.

"Ideal Elevator Door Hangers" are described and illus-

BOMMER

Floor Surface Spring Hinge

Double or Shingle Action, Holdback, Ball Bearing. Every moving part of this hinge can be oiled from a single hole on outside of side-plate.



The most durable hinge of its type; holds the door open when swung to 90 degrees at either side

Your Hardware Merchant Can Supply Them

Bommer Spring Hinge Company, Brooklyn, N.Y.



Stained with Cabot's Creosote Stain
C. M. Hart, Architect, Bay Shore, N. Y.

Stained Shingles

The Warmest, Most Artistic and Most Economical
of all House Finishes

Wood shingles are two or three times warmer than the gummed paper substitutes, and they are cheaper, last longer and are incomparably more artistic and attractive. When stained with the soft, moss-greens, bungalow-browns, tile-reds and silver-grays of

Cabot's Creosote Stains

they have a richness and beauty of tone that no other finish can equal and the creosote thoroughly preserves the wood. Use them also on siding, boards, sheds and fences. Anyone can apply them with best results at least expense.

Cabot's "Quilt"

makes floors and partitions sound-proof by breaking up the sound-waves and absorbing them. It makes walls and roof cold- and heat-proof by a cushion of minute dead air spaces that prevents the conduction of heat. From 25 to 50 times as efficient as cheap building paper.

You can get Cabot goods all over the country
Write for samples and name of nearest agent.

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Manufacturing Chemists BOSTON, MASS.
1133 Broadway, New York 24 W. Kinzie St., Chicago
Cabot's Brick Stains, Stucco Stains, Conserve Wood Preservatives, Damp-proofing, etc.



KELLASTONE

IMPERISHABLE STUCCO

A MONUMENT TO
THE TRIUMPHS OF
THE 20TH
CENTURY

More than ever before, there is a large demand for building materials suitable for remodeling. In every city or town there are many old frame or brick homes and public buildings which offer big sales opportunities to the contractor or dealer who will go after the business.

KELLASTONE

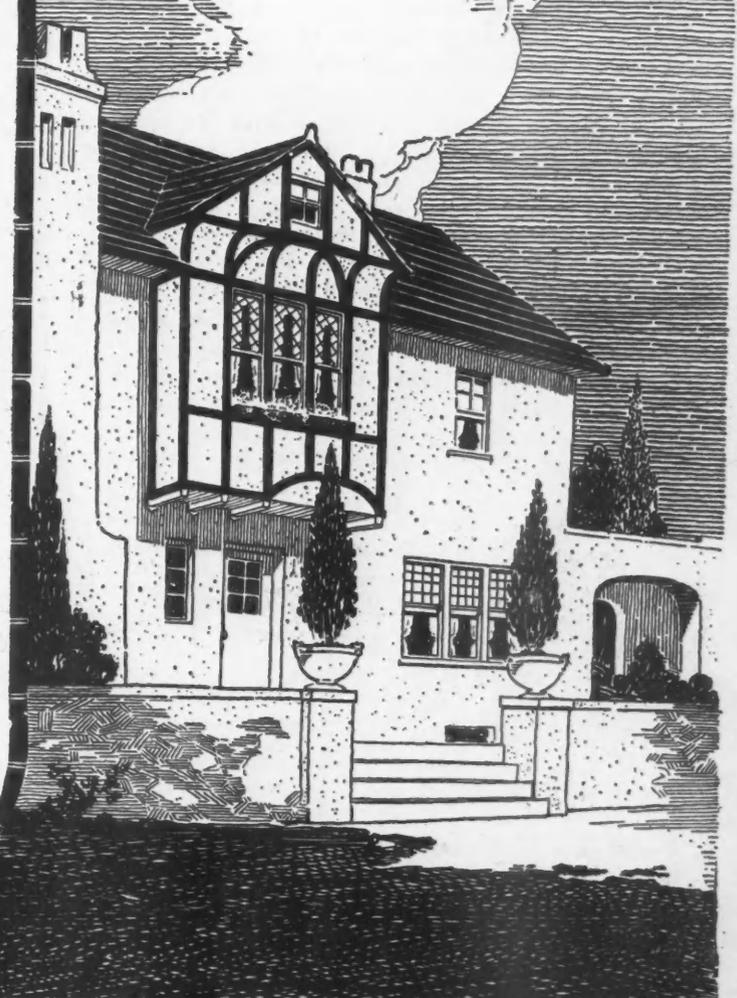
IMPERISHABLE STUCCO

Fulfills present-day need for a high-grade remodeling material as well as for new building, makes beautiful, permanent structures out of the plainest, unattractive buildings at low cost.

KELLASTONE is the original all-mineral magnesite stucco. Is applied in plastic form, sets to a stone-like consistency. Does not crack like ordinary stucco. Unaffected by fire, water, heat or cold. By using various colored granite or marble chips any color effect can be produced. Contains no Portland Cement, lime or gypsum. Is applied without disturbing occupants.

Write for particulars. Price advance only 15% in four years.

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trated in a pamphlet recently issued by the Richards-Wilcox Mfg. Co., Aurora, Ill. Sliding door locks, door fixtures and other hardware for doors are also listed.

"Borromite—Softer Than Rain Water" is the title of a booklet published by the Borromite Co. of America, Chicago, Ill. It is a story with pictures of the mineral, barromite, as it is used to soften water in homes, laundries, hotels, etc. The process and machinery are described in detail.

"Are Silo Roofs a Necessity?" is the leading article in the current number of the Ribstone aggregate, published monthly by the Playford Manufacturing Co., Elgin, Ill. It also contains several short articles on the Ribstone silo.

"Don't Burn Money Heating Your Water" is the subject of a small pamphlet recently issued by the Humphrey Co., Division of Ruud Mfg. Co., Kalamazoo, Mich. The economy of the Humphrey hot water heater is explained.

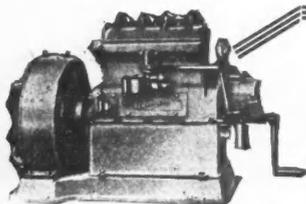
"Rubber Necessities for the Modern Building" is the title of a new catalog issued by the W. H. Salisbury Co., Chicago, Ill. Among the products described and illustrated are Flexible rubber tile flooring, fire protection equipment, mats and matting and accessories.

The Disston Crucible for June has a story on the manufacture of the two largest saws in the world which were built for a saw mill in California. The "Crucible" is published every month by the Henry Disston & Sons, Inc., Philadelphia, Pa. There is also an interesting article on the lumber resources of Brazil.

"The Story of Kellastone" is the title of a twenty-four page color cover booklet published by the National Kellastone Co., Chicago, Ill. It contains many pictures of beautiful homes which have been finished with Kellastone stucco. In addition to this booklet, the Kellastone company is also issuing specifications for stucco work and directions for making mixing compound.

Safety Switches, Steel Enclosed Industrial Control Switches, Service Entrance Switches, Plug Receptacles and other electrical devices are listed and described in the new annual Catalog 25 issued by the Square D Co., Detroit, Mich., and Walkerville, Canada. This catalog contains several photographic reproductions of safety installations from various parts of the country. The pocket size catalog is now ready for distribution.

"Timber Depletion, Lumber Prices, Lumber Exports and Concentration of Timber Ownership" is the subject of the report on Senate Resolution 311 prepared by the Forest Service. This report has aroused considerable interest in the lumber trade and a pamphlet on "Timber Depletion and the Answer" has been prepared, which is now available.



Universal

4 KW Generating Sets

are made in sizes to fit the requirements of Home, Farm,

Small Town, Circus, Church and School Lighting, etc., fully described in bulletin No. 30 which will be mailed free on request.

Used By United States Government

The fact that the United States Government used hundreds of Universal 4 KW Generating Sets during the late war is proof of their efficiency and reliability. Send for that bulletin today.

UNIVERSAL MOTOR CO.

OSHKOSH, WIS.

"Illumination as Influenced by the Light Reflection in Paint" is the leading article in the current number of the Dutch Boy Painter, published monthly by the National White Lead Co., New York, N. Y. An interesting article on painting gas holders is also published in this number.

A series of bulletins on Lighting Data has been prepared by the Edison Lamp Works of the General Electric Co., Harrison, N. J. Among the subjects discussed are "Maintenance of the Lighting Systems," "Effect of Color of Walls and Ceilings on Resultant Illumination," "The Lighting of Show Windows and Cases," "Artificial Lighting for Merchandising and Industry," and "The Lighting of Office Buildings and Drafting Rooms."

The Richards-Wilcox Door Bolt is described in catalog No. 519 recently issued by the Richards-Wilcox Mfg. Co., Aurora, Ill. This bolt is designed for heavy warehouse and freighthouse doors. The catalog also includes information about guide plates and steel flush door pulls manufactured by this concern.

"Simonds' Guide for Millmen" for July contains a description with illustrations of the Simonds saw factory at Lockport, N. Y. The story of the saw from the ore to the finished product is set forth in very interesting fashion.

A new price list supplement has been issued by the Keuffel & Esser Co., Hoboken, N. J. The prices contained in this booklet supersede the prices listed in their general catalog.

"Money-Making Equipment for the Modern Farmer" is the title of a twenty-four page cover booklet which is being distributed by the Phillip Bernard Co., Sioux City, Iowa. It contains descriptions, specifications for cupolas, hoghouse windows, building corners, metal shingles and other products manufactured by the Bernard Co.

"Novelty Boiler, Furnaces and Ranges" manufactured by the Abram Cox Stove Co., Philadelphia, Pa., are listed in the new catalog No. 73 recently issued by that firm. It contains forty pages with cover.

Conduits and Fittings, Wall Brackets, Fixture Studs and Metal Moldings are among the products described and illustrated in a series of bulletins prepared by the National Metal Molding Co., Pittsburgh, Pa. This firm manufactures an extensive line of electrical accessories and conduits.



SUPERIOR No. 45

CHEMICAL CLOSETS—SANITARY, ODOORLESS

Very easy to install and operate. Made along new ideas that interest the user. Let us tell you more about them.

SUPERIOR CHURN & MFG. COMPANY
NORTHVILLE, MICHIGAN

Monarch

KING OF BLOCK MACHINES

NOTICE THE WIDE RANGE OF ADJUSTMENT!

This means that the Monarch will make any size block you may want from silo blocks to foundation stones. Simple, strong inexpensive. This is the machine for your equipment.

ARE YOU INTERESTED?

Then send a post card asking for complete information and catalog.

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